USER MANUAL

SERIES 3

Screens Filter

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Andromeda Software Inc.

NOTE: View screened images in this document at 400% for accurate screen patterns and image evaluation

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SERIES 3 USER MANUAL

1.0 INTRODUCTION TO SCREENING

A given spot on a page of a printed document either has ink or no ink; printing does not deal directly in shades of gray. Therefore photographs or other material containing gray shades must be converted to spots of pure black or pure white.

The usual method of doing this is called screening. Screening essentially simulates shades of gray by converting light grays to tiny black dots on a white background while dark grays are represented by tiny white dots on a black background. Because of the optical characteristics of human eyesight, these dots, or in the case of more sophisticated screens configurations of dots, appear as various shades of continuous gray to the viewer.

A photograph after being screened is known as a halftone. If you look at a halftone in a newspaper or magazine under a magnifying glass it consists of a regular grid of dots. The grid is made fine enough so that individual dots are inconspicuous to the eye. If an area in the photo is 90% black, the halftone would be a white spot occupying 10% of its grid cell, the rest of the cell being black. If another area in the photo is 50% black, its halftone representation would be half black and half white in each cell. Magnified, this appears as a checkerboard, but to the eye, it just looks 50% white. Even though the eye will not see individual dots in the halftone, it will perceive their average brightness, or "gray value", over a small area.

The quality of a halftone image is dependent upon the fineness of the grid of dots, and the number of possible dot shapes for each dot.

The printing industry measures the grid of dots in terms of screen ruling. Screen ruling is equivalent to dots per inch but it is specified also in lines-per-inch (lpi). Screened photographs (halftones) you see in your newspaper are typically 85 lpi, while halftones in magazines are typically 150 lpi. The lpi used by the printing industry is dependent upon paper type used for printing and capability of the printing presses used. In use for many years, halftone technology is highly developed. Andromeda's Series 3 Screen Filter provides a special effects digital halftoning, with variations in screen value, screen angle, and spot shape.

1.1 What is a Mezzotint?

Mezzotinting is an alternative to halftoning as a way to simulate gray values with a fine pattern of pure black and white. A mezzotinted photo consists of small, irregular shapes, rather than a regular grid of dots. In light areas the mezzotint looks like small black shapes on a white background; dark areas have small white shapes on a black background. When viewed close up, the shapes look like chromosomes or worms. Mezzotints, like halftones, have screen values expressed in lines per inch; however in the Series 3 Filter, it is given in terms of "worms per inch".

Figure 1 comes from a gray-scale image, 400x100 pixels, 300 pixels per inch, containing a blend from black on the left to white. To show the mezzo "worms" in detail, the image was converted very coarsely, at only 35 worms/inch (using the Uniform Mezzo option).

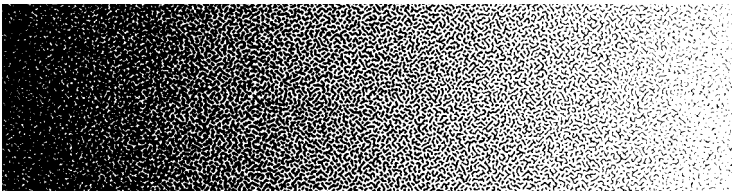


Figure 1

Mezzotinting is used more for special effects than for maximum photographic accuracy in reproduction. Frequently mezzotinting will be done at a worms/inch figure where the individual shapes can be perceived, giving a deliberately grainy or impressionistic effect, which can be somewhat mysterious looking. Mezzotinting is sometimes used in conjunction with deliberate blurring of the photo, and occasionally in conjunction with exaggerated sharpening. The Andromeda Screens Filter provides both blurring and sharpening capability.

Figure 2 contrasts halftoning and mezzotinting conversions. The image is 400 x 100 pixels, 200 pixels per inch. The top was halftoned at dots/inch=50, the bottom was mezzotinted at worms/inch=50, blend=50% screen, threshold=128.

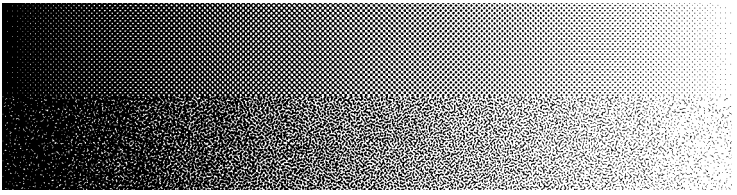


Figure 2

1.2 Screening Process In the Filter.

The Screens Filter has the following processes:

1. Input Photo: The gray-scale or color image is received from the host application when the Filter is started. If part of the image in the host application is selected when the filter is started, that selection becomes the input photo.

2. Enhanced Photo: The input photo is enhanced within the filter by either of two processes: neighborhood enhancement or unsharp masking. Either process can be used to sharpen or to blur the input photo, depending on a slider. Optionally, enhancement can be turned off.

3. Mezzotint: If selected, an array of irregular, worm-like shapes, is made by the filter as a mezzotint screen. Several varieties of mezzotint screen can be selected, including uniform; expanding on the X and Y axes; and expanding radially. Mezzotints are created in the Filter from internal data and algorithms.

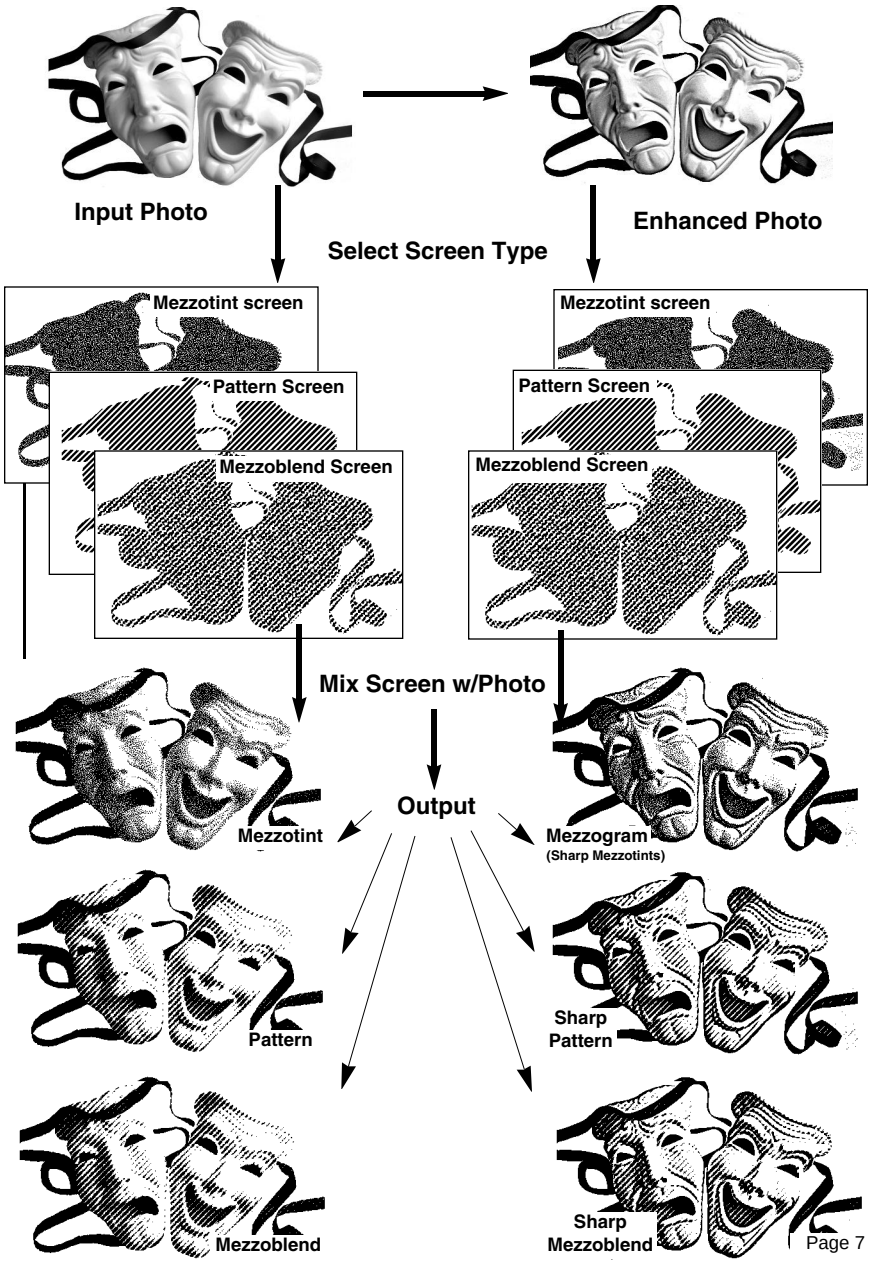
4. Pattern: If selected, a geometric pattern screen is made by the Filter. Some possibilities are: arrays of dots of several kinds; arrays of straight or wavy lines; families of concentric circles or ellipses, either smooth or wavy; and spokes or spirals. The waves in the lines and ellipses can be sinusoidal smooth or sharp. Patterns are created in the Filter from internal data and algorithms.

5. Mezzoblend: An optional screen selection, uniquely characteristic of the Screens filter, made by combining a mezzotint and a pattern; the two can be combined by either blending or differencing.

6. Mix: A process by which the screen and enhanced photo are combined to make the output photo. In the mix, each pixel is a linear combination of the corresponding pixels in the screen and those of the enhanced photo.

7. Output Photo: This is the final image prepared by the Filter and returned to the host application. This final image can either be the enhanced photo by itself, the screen by itself, a mix of the two, or the mix with a threshold applied. The default has photo enhancement and threshold applied, which results in a screened output photo that is pure black and white.

The following figure shows the screening process in the filter, there are six processes as shown:



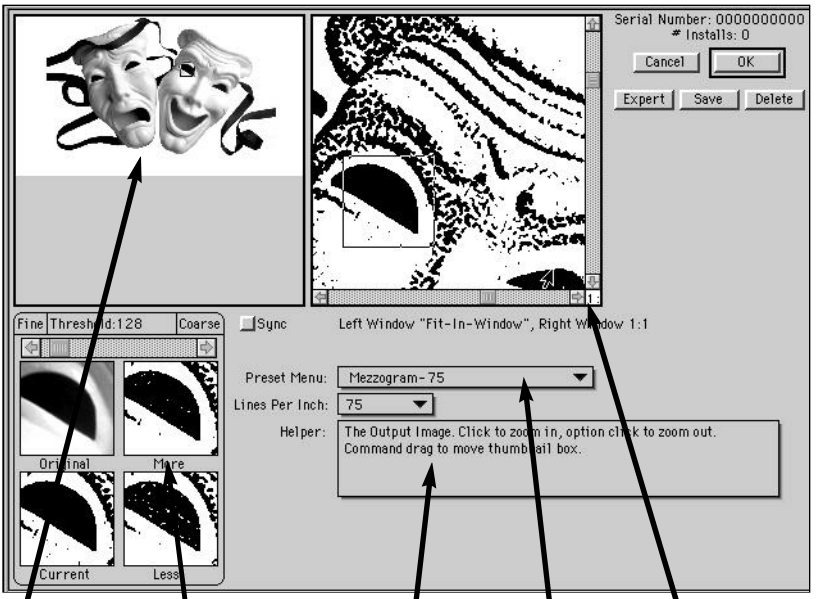
2.0 Installation and Registration.

Note 1: You should not install the plug-in by dragging or copying it to the appropriate Photoshop folder or directory, you should use the Andromeda Installer.
Note 2: (Windows™ only). The Series 3 Screens filter is a 32 or 64 bit plug-in. You must have Photoshop CS3 (or higher) or another host application that runs Photoshop compatible plug-ins.
Note 3: (Macintosh and Windows). The following installation assumes that you are going to be using the Series 3 Screens Filter with Adobe Photoshop xx™. Please refer to the host application User Guide for installing Photoshop compatible plug-ins. Please also refer to the README file with the Series 3 product files for information on compatibility with other host applications.

3.0 The Novice Mode User Interface

The Screens Filter opens in NOVICE mode. Novice Mode has factory installed, ready to use screens called "Presets". You can select a Preset screen and have it automatically applied to your gray scale Input Photo in a single step. We suggest you use Novice mode for your first mezzotints. Later you can explore the EXPERT mode which gives complete control over all the variables. The convenience of using preselected, extensively researched and tested screens in Novice Mode will make your production task quick and efficient.

3.1 Windows and Menus



The **Left Preview Window** shows the Input Photo, the **Right Preview Window** shows the screened Output Photo

As you point to each area, the **Helper Window** pops up a description of its function.

Zoom: The cursor changes to a magnifying glass over the Preview Window. Click & Option Click will cause Zooming in & out. It is best to see the screening at 1: 1. Here ":3" indicates "1:3" magnification, "3:" indicates "3:1" and so on).

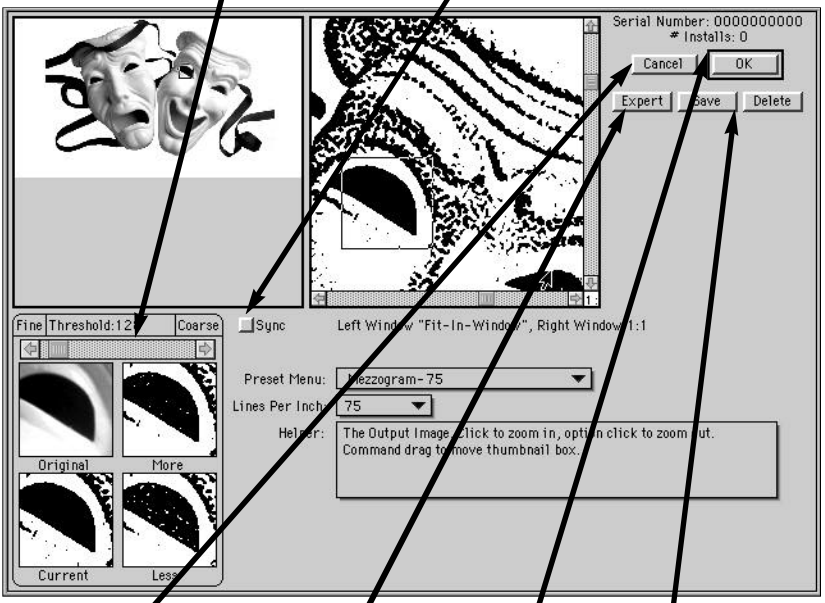
Clicking on the **More** Window makes the Output Photo darker, **Less** makes it lighter by varying Threshold. The four **Variation Windows** show the part of the Preview Window image enclosed by the thumbnail box

Preset Screens menu contains a large variety of factory installed & tested screens. Select one and you are done! Below it is the **Lines Per Inch menu** screening resolution selection.

3.2 Buttons and Sliders

Variation Windows Slider: Clicking on the More Window increases the Threshold value; clicking on the Less Window decreases it. The amount of increase or decrease is controlled by the Fine-Course slider

Sync checkbox. If checked, all zoom and pan operations done to one of the Preview Windows is also done to the other, so that both Window A and Window B have the same view. If not checked, the two Preview Windows can be zoomed and panned independently.



Cancel button quits the Screens Filter and returns to the Host Application without doing anything to the image. Only settings that were explicitly saved in Novice Mode are saved, otherwise the current settings are lost.

Expert button opens a dialog box which allows the user to individually set each parameter by moving sliders or typing in values, and previewing the different steps in the screening process.

OK button saves the current settings and begins to apply them to the high resolution image stored in the Host Application. A progress bar appears to indicate the current status of the screening operation.

Save button allows saving of parameters adjusted in Expert mode as a new preset in the Preset Menu.
Delete button clears the selected preset from the menu.
Please see section on Saving, Creating and Deleting Presets.

3.3 “4:1 Rule” & Other Tips for Good Screening

(1) Before starting, know the lines per inch (lpi) screen ruling or screening resolution required to print your image. Ask your printer.

(2) Start with Input Photo resolution that is at least 4 times the lpi required for printing your image. **(4:1 Rule)**. For example if your image is to be printed at 65 lpi, then start with a grayscale image that is at least 65 X 4 = 260 dots per inch. If the resolution is higher then 4 times lpi, you will get even better detail, as long as your output recorder can output at that resolution. However, if it is lower, the screening will be poor since screen pattern will appear pixelated. If your input image does not meet the 4:1 rule, consider using Image Size command in Photoshop to increase resolution by interpolation or better yet get a higher resolution scan.

Poor 65 lpi screening
Image Res. 200dpi
Does not meet 4:1 rule

Good 65 lpi screening
Image Res. 300dpi
Meets 4:1 rule

Better 65 lpi screening
Image Res. 600dpi
Exceeds 4:1 rule

(3) The 4: 1 rule applies to Presets in Novice mode and of course any work done in Expert Mode.

(4) Check the quality of the screen in the Preview Window always at 1:1 magnification.

(5) Clicking on the OK button saves the current settings and begins to apply them to the high resolution image stored in the Host Application. A progress bar appears to indicate the current status of the screening operation. When done, you have a screened output image that is pure black and white line art, **in Photoshop change the Mode to Bit Map with 50% Threshold, for a significantly smaller file size & faster printing speed.**

(6) The screened output from Series 3 should not be scaled.

(7) If you are experimenting with the filter, we suggest you work with a 600 dpi gray scale input photo. Applying the 4:1 rule, this allows a range of 10 to 150 lpi output screening resolution for experimentation. It also allows spectacular camera ready proofs on your 600 dpi desktop laser printer.

3.4 Preset Menu Categories

Series 3 Screens comes with factory installed, ready to use screens, called "Presets" accessible from Novice Mode only. The presets are categorized as follows (in alphabetic order):

Mezzotints. Series 3 Screens is the first true electronic mezzotinting technology available on the desktop. A mezzotinted photo consists of small, irregular shapes, rather than a regular grid of dots seen in a conventional halftone. In light areas the mezzotint looks like small black shapes on a white background; dark areas have small white shapes on a black background. When viewed close up, the shapes look slightly like chromosomes or worms. Mezzotinting is used more for special effects than for maximum photographic accuracy in reproduction. Frequently mezzotinting will be done at a low resolution (lpi) where the individual shapes can be perceived, giving a deliberately grainy or impressionistic effect, which can be somewhat mysterious looking.
The mezzotint category has selection of mezzotint screens at various Lines Per Inch (lpi) screen ruling.

Mezzograms. Mezzogram screen is Mezzotinting used in conjunction with deliberate sharpening of the image. The resulting screened image is crisper, has more contrast and detail. Mezzograms are ideal for retail packages, product shots in ads, catalog items and anytime sharper detail is necessary in a mezzotint. The mezzogram category has a selection of mezzograms at various Lines Per Inch (lpi) screen ruling.

Mezzoblends. Mezzoblend screen is uniquely characteristic of the Screens filter; it is made by combining a mezzotint and a pattern. The two may be combined by either blending or differencing. The blended screens simulate a variety of textured materials such as Mesh, Burlap... The mezzoblend category has a selection of mezzoblends at various Lines Per Inch (lpi) screen rulings.

Patterns. The Screens Filter can create a large number of geometric or algorithmic patterns. Some possibilities are: arrays of dots of several kinds; arrays of straight or wavy lines; families of concentric circles or ellipses, either smooth or wavy; and spokes or spirals. The waves in the lines and ellipses can be sinusoidal (smooth) or sharp.

Special Effects. Series 3 Screens features thirty-one special effect presets. Testing at Andromeda generated dozens of presets, and the Special Effects category contains the most evocative collection. Since each effect can be easily modified in Expert Mode, they serve as efficient points of departure to quickly navigate to more specific effects. Of course, due to relative scale, not all presets will be appropriate for all images; what's good for landscape may not be good for portrait, or smaller selections.
The Fabric sub-category offers a range of textures similar to those found on softer surfaces. The FX category explores various phenomena best applied to landscape or broad-based images. The Intaglio section offers settings reminiscent of Nineteenth Century printing techniques.

Text Effects. Text Effects in Series 3 Screens offers nine special presets. Two of the nine are designed to work most effectively with blocks of texts. All of the presets explore the application of extreme negative unsharp masking. A study of their settings shows that very high slider settings can produce decorative effects through-out the filter. Preparing richly toned characters can lend greater depth to screened text (See section 6.5 "Text Screening Session"). Highly decorative text styles can be achieved by recycling previously filtered characters for a second or third Text Preset screening.
For optimum effect, it is suggested that a point size of 18 or higher be used to provide sufficent scale both for the purpose of preparation and screening.

See also Section 6.0 "Screening Sessions" - it offers insight into experimenting with new settings. Since each Preset was developed in Expert Mode by experimenting with settings and then named and saved in Novice Mode, join the Series 3 Special Effects frontier as you discover, modify, and save your own Preset collection.

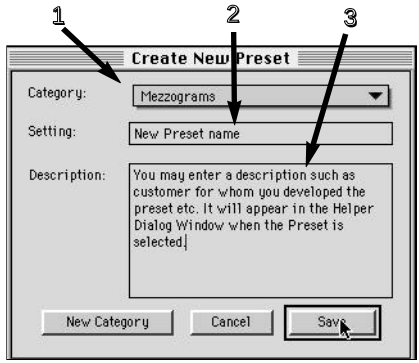
3.5 New Presets or "Untitled Presets" (Saving)

Saving a New Preset can be done only in Novice Mode.

In the Novice mode, if you change the lpi of a existing preset, the presets' name changes to "Untitled Preset" in the Preset menu, a temporary "alias" to the original name. Since the original preset has a modified parameter, the Filter provides the option of saving "Untitled Preset" under a new category and a new name by clicking on the Save button. You do not have to save a modified preset ("untitled preset"), however, if you need to here are the steps:

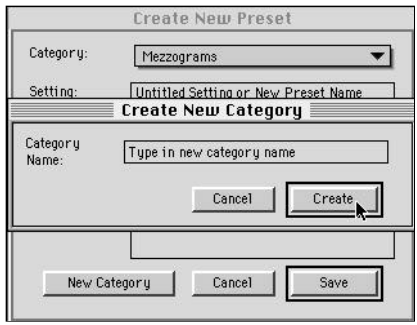
1. Click on the Save button to open up a Create New Preset dialog box.

2. To Save a new preset in an existing category: (see figure) Step 1, select a existing category from the Category pull down menu; Step 2, type in a unique new preset name (1-31 chars) in the Preset Name box; Step 3 (optional) annotate the new preset in the Description dialog box, this annotation will appear in the Helper Dialog when you next select this preset. Click on Save button.



Save a new preset in existing category

3. To Save a new preset in a new category: First, click on the New Category button to open up a Create New Category dialog box. Type in a new category name (1-31 chars) instead of "Untitled Category" in the box. Click on Create button. The Create New Preset dialog box appears, (see steps 1, 2 , 3 above) type in a unique new preset name (1-31 chars) in the Preset Name box; (optionally) annotate the new preset in the Description dialog box, this annotation will appear in the Helper Dialog when you next select this preset. Click on Save button.



Save a new preset in a new category

The Cancel button in any dialog will quit the dialog box without affecting any setting.

3.6 Housekeeping Presets: (Modifying, Renaming, Copying, Changing Categories, Deleting, Updating Helper Description).

Modifying, Renaming, Copying, Changing Categories, Deleting and Updating Helper Description can be done only in Novice Mode.

To modify an existing preset: Enter a change such as new Line Per Inch value, the name in the Preset Menu will revert to "untitled preset", click on Save, the Create New Preset dialog box will pop up, now Save into existing category (refer to 2. previous page).

Renaming an existing preset: Enter a new name in the Preset Menu , click on Save, the Create New Preset dialog box will pop up, now Save into existing category (refer to 2. previous page). The old preset must be deleted. The delete procedure is described in the Delete section below.

Copying an existing preset. Select the preset to be copied from the Preset menu and Save it in the same or another category under a new preset name (refer to 2. & 3. previous page).

Moving an existing preset (or Changing Categories): Select the preset to be moved from the Preset menu and Save it in another category under a new preset name (refer to 3. previous page). Delete the old preset in the old category. The delete procedure is described below.

Delete an existing preset: To delete a preset, select it in the Preset menu, click on the Delete button, it will open the Delete confirmation box where you can make a final decision to either Cancel or complete the deletion of the preset from the Preset menu. If the preset appears in more than one category, the preset will only be deleted in the category that was chosen in the Preset menu.

Modify Helper Description: Click the Save button to open the Create New Preset dialog box. The existing Helper Description information text can now be edited. Clicking on the Save button will save the text and it will immediately appear in the Helper Window.

"Untitled Preset" will appear in the preset menu indicating that the last preset used was modified and left as is and not saved under a new name. You may choose to keep it that way (!) and not save each modification.

3.7 Using Novice Mode: Your First Screening Session

1

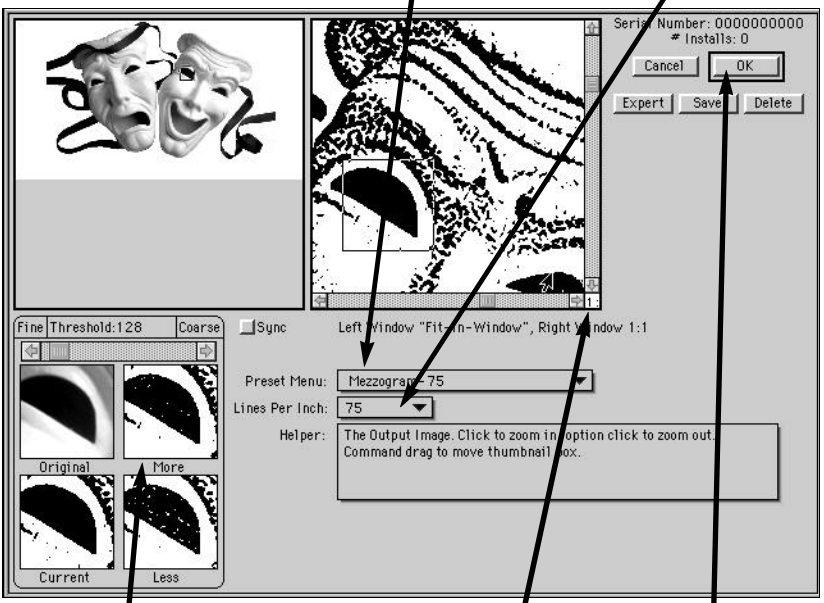
Check the ratio of Input Photo resolution to screen resolution (lpi). For Series 3, it must be 4:1 i.e. to screen at 75 lpi, the Input Photo resolution must be at least 75 X 4 = 300 dpi. See section 3.3 on "Rules and Tips for Good Screening".

2

Select screen type from the Preset Menu i.e. Mezzogram - 75

3

(optional) Adjust the Lines Per Inch (lpi). Remember ratio of Input Photo resolution to lpi must be at least 4:1



4

Zoom in until magnification is 1:1 in lower right window. Check the screened output image quality by scrolling.

5

(optional) Click on More to darken & Less to lighten the screened output image by varying the Threshold. To view another area of the the Preview image, hold down the Command key (Mac) Ctrl key (PC), drag the Thumbnail box and release on top of new area

6

Click OK to start screening. When finished and back in Photoshop, convert MODE to BITMAP (50% Threshold).

4.0 Expert Mode User Interface

4.1 Novice Mode vs. Expert Mode. When should Expert Mode be used?

The Screens filter starts up in Novice Mode and this is where most users will stay. There are times, however, when the Presets will not be enough and you will need to venture into Expert Mode to choose your own settings. Use Expert Mode if you wish to do the following:

(1) Create additional Presets (if the factory installed Presets are not enough).

(2) Experiment with different settings of the many parameters available to the program.

(3) Use an existing Preset, but with one or more of the settings modified.

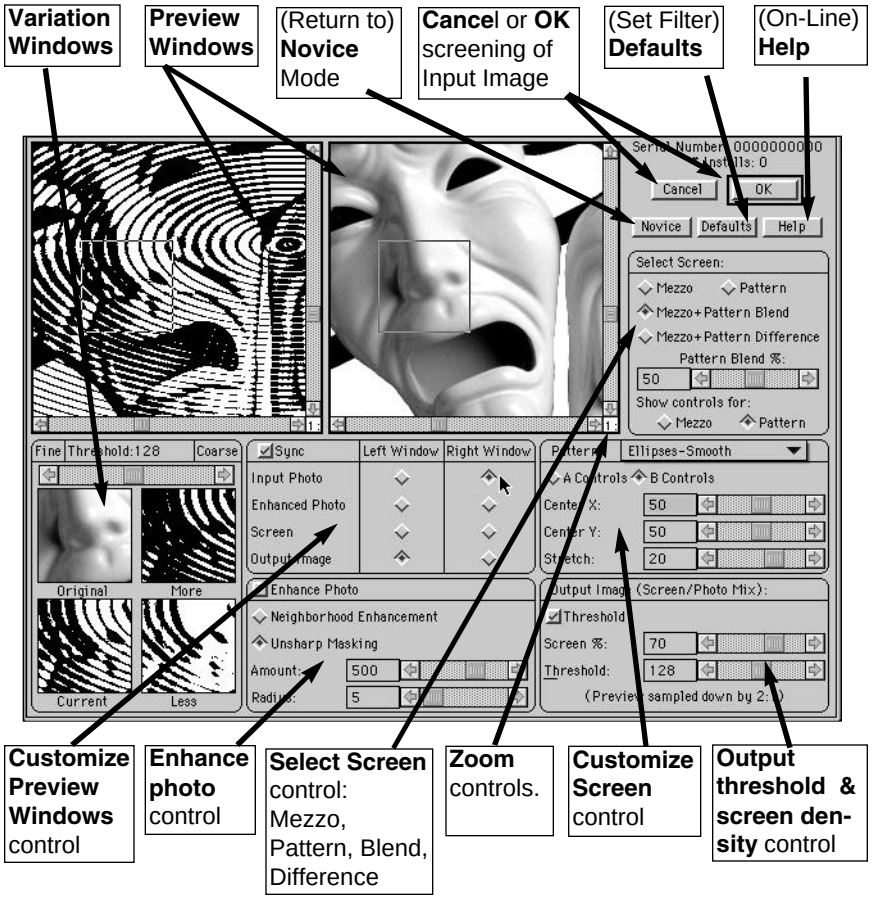
(4) Preview just the Sharpening, Screen, or Pattern being applied to the image.

(5) Read the online Expert Mode Help information.

4.2 Expert Mode User Interface

Expert Mode is entered by clicking on the "Expert" button while in Novice mode. All parameters that characterized a preset in Novice Mode are accessible for modification in Expert Mode. In addition, you may experiment with new settings and create additional presets. If you need to save a preset in the Preset Menu, you will need to return to Novice Mode to utilize the Save feature.

To decide whether Expert mode is for you, please read previous section "Novice Mode Vs Expert Mode".



Expert Mode User Interface. Details on items listed above start on next page
See the Glossary for details on every button, menu & screening concept

4.3 Preview Window

The two large image display windows remain in the same locations in both Novice Mode and Expert Mode, referred to as the Left Window and the Right Window.
Just like in the Novice Mode, the preview windows may be independently zoomed and panned, or they may have identical magnifications and positions if the Sync button (below the Left Window) is checked.

The square displayed inside both windows shows the current position of the view in the Variations Windows. This square can be moved by holding down the Command key on the Mac (Control key on the PC) and dragging the box.

Clicking the mouse over the Preview Windows zooms in, and Option-clicking zooms out on the Mac (Alt-clicking zooms out on the PC). To see the screened output image, it is best to Zoom in at 1:1 (see the lower right corner of each window for magnification status ":3" indicates "1:3", "3:" indicates "3:1" and so on). Clicking the small square on the bottom right does a fit-in-window.

Due to memory constraints, sometimes it is not possible to make the full resolution source image available in the Preview Windows of the Screens filter. This is especially true of large images. You will notice under the Threshold slider in Expert Mode it will say either (Full resolution preview) or (Preview sampled down by 2:1), or some higher ratio. This means that when zooming in the Preview Windows, you will see less detail than in the Host Application if the image has been sampled down. This does not affect the final output, only the previews. Once you have clicked OK, the image will be rendered in full detail.

4.4 Variation Windows

Variations of any slider value in Expert Mode can be done in the Variation Windows by clicking on the specific slider name. When the slider has been selected in this manner, a short underline appears under the slider name to show it has been selected. Also, the name of the selected slider and its current value appear above the Fine-Coarse slider at the top of the Variation Windows.

For example, if the Variation Windows are currently being used to adjust Threshold, and its current value is 128, you will see "Threshold: 128" displayed in the bar above the boxes. You will also see a short underline under the name "Threshold" adjacent to the Threshold slider.

Suppose you wish the Variation Windows to adjust Unsharp Masking Amount instead. Click the word “Amount” in the Enhance Photo box, and you will notice it then becomes underlined. If its current value is 350, you will see “Amount:350” appear above the Fine-Coarse slider at the top of the Variation Windows.

Clicking on the More Window increases the selected slider’s value; clicking on the Less Window decreases it. The amount of increase or decrease is controlled by the Fine-Coarse slider above the Variation Windows.

Holding down the Command key on the Mac (Control key on the PC) and pressing the mouse button allows you to move the square in the Preview Windows which selects the area displayed in the Variation Windows.

4.3 Novice, Cancel, OK, Default, Help Buttons

Novice
Clicking on the Novice button takes you back to the Novice Mode. This is the initial dialog displayed when entering the Screens Filter. This button’s function toggles to let you jump from Novice to Expert & back.

Cancel
Clicking on the Cancel button quits the Screens Filter and returns to the Host Application without doing anything to the image. Only settings that were explicitly saved in Novice Mode are saved, otherwise the current settings are lost.

OK
Clicking on the OK button saves the current settings and begins to apply them to the high resolution image stored in the Host Application. A progress bar appears to indicate the current status of the screening operation. The time it will take depends on the image size, the memory configuration, and the computer speed. The user may abort by clicking on the “Cancel” button next to the progress bar (or typing Command-Period on the Macintosh, Escape on the PC). The settings will be saved (to the Prefs file) even if the rendering is cancelled after clicking OK. The “current settings” saved by clicking OK are used in two ways: (1) they are the initial settings the next time the Screens Filter is run (even if the Host Application is restarted), and (2) if the Screens Filter is applied to an image without running the user interface, these are the settings used.

In Photoshop™, after the Screens Filter has been applied the first time, the user interface can be bypassed with the “Last Filter” command at the top of the Filter menu (or by typing Command-F on the Macintosh, Control-F on the PC). To force the user interface to appear, hold the option key down on the Macintosh, or the Alt key on the PC while doing the “Last Filter” command.

After the Screens filter is done rendering the image, the user can use the “Undo” and “Redo” commands (Command-Z on the Mac, Control-Z on the PC), to toggle between the unscreened and screened images. Also, the “Revert” command will return you to the original image (as saved on disk).
Important Note: When done, you have a screened output image that is pure black and white line art, in Photoshop change the Mode to Bitmap with 50% Threshold, for a significantly smaller file size without affecting quality of the screened output. DO NOT SCALE OR RESAMPLE AFTER SCREENING.

Defaults

Clicking on the Defaults button opens up the Defaults dialog, and gives a choice of setting all parameters to their default values, or just a group of settings. This is a quick way of getting back to reasonable values if you have been experimenting with unusual settings.

Help

Clicking on the Help button provides on-line Help, which displays most of the information on Expert Mode found in the manual. Selecting a category at the top displays information about that category on the bottom.

While Help is active, all buttons and controls in the main filter dialog are disabled, including the Cancel button. You must click “Done” to get out of Help before doing anything else.

4.6 Customize Preview Window controls:
In Expert Mode, the buttons adjacent to each window may be used to display any of the following images processed by the Filter: Input Photo, Enhanced Photo, Screen & Output Image. The default settings are Input Photo (Left Window) and Output Image (Right Window).

4.7 Enhance Photo controls:

The Enhance Photo box allows selection of the Enhancement or “sharpening” of the original Input Image by one of two methods: Unsharp Masking or Neighborhood Sharpening. Either process can be used to sharpen or blur the input photo by an amount corresponding to the Amount slider value. Enhancement can be turned off to eliminate this step in the screening process by unchecking Enhance Photo.

When using Mezzo, Pattern, Blend or Difference screening, a crisper, sharper detailed screened image will be output because the Filter will as a default enhance the Input Photo. As a default, the Enhance Photo box is checked and the corresponding specified sharpening parameters are automatically applied to the Input Image before subsequent screening. Andromeda terminology for sharpened mezzotints is Mezzograms. You may turn off Enhance Photo to screen your gray scale photo to a traditional (standard) mezzotint.

To observe the comparative differences between the original photo and the enhanced photo, click on Input Photo in the Left Window column, and Enhanced Photo in the Right Window column. Please note that previews (and rendering) with Unsharp Masking Radius set to a value higher than 20 is dramatically slower.
In spite of its name, this is a sharpening procedure. (The name is an industry standard and is a bit misleading.) It is used to make edges in the Input Photo appear sharper, or more in focus, before any Screen is applied. Its operation is somewhat similar to Neighborhood Sharpening, but is more powerful, having an adjustable Radius parameter, and a weighted rather than uniform average over the neighboring Pixels. Unsharp Masking in this filter is similar to Unsharp Masking operations in other image manipulation programs such as Photoshop™.
Different values of the Amount slider produce different effects, as follows:

Amount	Slider Effect
less than-100	Haloing or ghosting (special effect)
-100	Pure blur
-99 to -1	Combination of blur and original
0	Original, unmodified
1 to 100	Combination of sharpening and original, original weighted more
more than+100	Combination of sharpening and original, sharpening weighted more

4.8 Select Screen controls:

This box contains controls for selecting the four general screens currently available in the Screens filter:

Mezzo:
Clicking on Mezzo changes the type to a sharpened Mezzotint. Mezzotinting is an alternative to halftoning as a way to simulate gray values with a fine pattern of pure black and white. A mezzotinted photo consists of small, irregular shapes, rather than a regular grid of Dots. In light areas the mezzotint looks like small black shapes on a white background; dark areas have small white shapes on a black background. When viewed close up, the shapes look slightly like chromosomes or worms. When you select Mezzo, by default the Filter generates sharpened Mezzotints called Mezzograms. A true photographic quality mezzotint (unsharpened) may be output by turning off Enhance Photo.

Pattern:
Selecting it changes the type to Pattern. The Screen Filter can create a large number of geometric or algorithmic patterns. Some of these patterns are familiar "line conversion" screens used traditionally by production houses using photographic screens.
Some of the patterns are: arrays of dots of several kinds; arrays of straight or wavy lines; families of concentric circles or ellipses, either smooth or wavy; and spokes or spirals. The waves in the lines and ellipses can be sinusoidal (smooth) or sharp.

Mezzo+Pattern Blend (Mezzoblend):
Selecting Mezzo + Pattern Blend in the Select Screen box changes the type to a Blend, or weighted average of a Mezzotint and a Pattern. The Pattern Blend % slider appears, which controls how much Pattern and how much Mezzo will be used in the Blend: 0% is all Mezzo, 50% is half and half, and 100% is all Pattern.

Use the “Show controls for:” buttons to set controls for either the Mezzo Type or the Pattern Type. This allows efficient toggling to adjust the blend. To Preview either Mezzo or Pattern being used in the blend, you must click on the Mezzo or just the Pattern, and then reselect Mezzo+Pattern Blend when done previewing. You can also temporarily set the Pattern Blend % to 0 to see just the Mezzo, or 100 to see just the Pattern, and then set it back when done previewing.

Mezzo+Pattern Difference:
Works the same way as Mezzo+Pattern Blend except it is their difference rather than a weighted average. Use the “Show controls for:” buttons to set controls for either the Mezzo Type or the Pattern Type. This allows efficient toggling to adjust the blend. To Preview either Mezzo or Pattern being used in the difference, you must click on the Mezzo or just the Pattern, and then reselect Mezzo+Pattern Difference when done previewing.
Please use the Expert Mode Glossary for explanation of other menu or buttons associated with Select Screen control.

4.9 Customize Screen controls

The four general screens i.e. Mezzo, Pattern, Mezzo+Pattern Blend, Mezzo+Pattern Difference can be further customized.

If you selected Mezzo, a drop down menu provides a choice of five Mezzotint types. The Uniform Mezzo type corresponds to standard Mezzotints made by photographic means. The others Mezzo XY Growth, Radial Growth A and Radial Growth B provide special effects not available using photographic methods.
Each type is controlled by several sliders. For all mezzo types except Uniform Mezzo, the sliders belong to one of two groups, denoted “A Controls” and “B Controls”.

If you selected Pattern, a drop down menu gives a choice of fifteen Pattern types. There are six Corrected Patterns, and nine Uncorrected Patterns. Corrected Patterns minimize Posterizing and Moire effects, and perform better than the others when used alone, as opposed to in a Blend. Uncorrected Patterns have more variety and more range in their parameter settings, and are most useful in Blends with Mezzos or for creating Artistic Effects.

If you selected Mezzo + Pattern Blend or Difference, both the Mezzo Type and the Pattern Type must be individually customized, one at a time, using “Show controls for:” buttons to set each one.

Since there are many customization options, we request that you try the options and reference Expert Mode Glossary for explanation of any menu or button item encountered in the Customize Screen control window.

4.10 Output Threshold and Screen Density control

To request screening, Threshold must be on. To output a screened pure black and white image, the Filter combines the selected Screen and the Input Photo and then applies a Threshold.

Threshold is a general term for converting a Grayscale value into a black or white value by comparing it with a cutoff number. For example, if the cutoff is 128, all Grayscale values in the range of 0-128 are turned black and all values in the range of 129-255 are turned white. The Threshold slider in this box controls the cutoff value.
Moving the cutoff value to higher than 128 will cause gray values higher than 128 to be turned black, this will tend to darken the entire image. Higher cutoff values will tend to plug up shadow areas, and darken highlight areas. Lower cutoff values will tend to open up shadow areas but it may wash out highlight areas. In our testing we find that the range of 115 to 128 worked for most images. The Filter default is set to 128.

The Screen % slider controls output contrast. Less screen percent shows more image and less screen (higher image contrast), and more screen percent shows more screen and less image (lower image contrast). 100% produces an output image with just screen, and no original image. 0% produces an output image with just enhanced image, and no screening. Normally, values around 50% are used. Range: 0 to 100.
In our testing we find that 45% to 50% range gives the image more punch without washing out the screening effect while 50% to 60% range emphasizes the screen without washing out the image. The Filter default is set to 50%

5.0 Expert Mode Glossary

Spokes
This slider sets the number of spokes for the Spokes Pattern Type.

Waves
For wavy ellipses, the perimeter of each ellipse goes in and out a number of times set by this slider. If # waves is 0, the ellipses are smooth. Range: 0 to 100.

A Controls
If more than three sliders are required for a particular Mezzo or Pattern Type, they are divided into two sections: A Controls and B Controls. Clicking on one or the other makes all the sliders available to the user.

Amount
This slider controls the amount of Sharpening. For Unsharp Masking, the default is set to 350 for fairly dramatic sharpening. For Neighborhood Enhancement the default is set to 100. Please see Unsharp Masking or Neighborhood Enhancement for more details. Range: -500 to 1000.

Angle
Tilts entire Pattern; positive angles are counterclockwise, negative angles are clockwise, 0 degrees is horizontal. Uncorrected Patterns use precise angles. Corrected Patterns round the angle selected by the user to the nearest integer ratio, which is within 2 degrees of the desired angle. Range: -90 to +90 degrees.

Artistic Effects
This refers to settings that are chosen to produce a certain “look” rather than accurate reproduction of the original Input Image. This is the more creative side of the Screens Filter.

Asymmetry
Controls the shape of Corrected Dots. See Corrected Dots-pgs 27/28 for the specific effect. Range -100 to 100.

B Controls
If more than three sliders are required for a particular Mezzo or Pattern Type, they are divided into two sections: A Controls and B Controls. Clicking on one or the other makes all the sliders available to the user.

Bitmap
This term is used to mean a Binary, 1-bit per Pixel image, where each Pixel is either on or off (black or white). Technically, there can be Grayscale or color bitmaps, but that is not how we are using this term in our manual.

Binary
This term is used to mean a 1-bit per Pixel image, where each Pixel is either on or off (black or white). In this manual, Binary is interchangeable with Bitmap, although technically the two terms mean different things.

Blend
A combination of a Mezzotint and a Pattern produced by taking a weighted average of the two Pixel values. See Mezzo+Pattern Blend or Mezzoblend

Blurring
An Enhancement which defocuses an image.

Cancel
Clicking on the Cancel button quits the Screens Filter and returns to the Host Application without doing anything to the image. Only settings that were explicitly saved in Novice Mode are saved, otherwise the current settings are lost.

Center X
This sets the position of the center of Ellipses and Spokes along the photo's X (horizontal) axis. If 0, the center is on the photo's left edge; if 100, the center is on the right edge. Range: 0 to 100 (% of photo width).

Center Y
This sets the position of the center of Ellipses and Spokes along the photo's Y (vertical) axis. If 0, the center is on the photo's top edge; if 100, the center is on the bottom edge. Range: 0 to 100 (% of photo height).

CMYK
A four color image consisting of Cyan, Magenta, Yellow and Black layers. ("K" is used for Black so as not to be confused with Blue from RGB.) Each layer is usually an 8-bit grayscale, so each pixel requires 32 bits (4 bytes) of storage.

A color image must be converted to CMYK before printing on a printing press. Images are normally scanned and displayed on the computer screen in RGB. The RGB->CMYK conversion may be done by the Host Application (before or after applying the Screens Filter), or it may be done later by some other program, or by the printer driver.
CMYK colors are subtractive, and are printed on white paper. Although any color (including black) can be produced by the three primary pigments: Cyan, Magenta, and Yellow, the fourth black layer is used to produce better quality (black text looks much better when printed with black ink than a combination of CMY inks.). The four layers are printed at four different screen angles to avoid Moire Effects.

Constrain File Size
A checkbox in the Photoshop™ Image Size dialog. If you want to increase resolution of your image by reducing its size then check this box. Your image will not be resampled. If you want to resample your image to a lower or higher Image Resolution before running the Screens Filter, uncheck this box.

Corrected
Before one of the first six Patterns is used in a Screen, it goes through a process which adjusts the Grayscale distribution in each pattern cell. This adjustment improves the rendition of Grayscale tones during the Screening process, and minimizes Posterizing. A further important property of each Corrected Pattern is that all cells in the entire Pattern are absolutely identical. This requirement avoids Moire Effects. Because of these two special properties, Corrected Patterns perform better than the others when used alone, as opposed to in a Blend, for Screening.

Corrected Dots-Cross
White squares or rectangles on a black background. Cross and Square dots can give impression of superior sharpness in some circumstances. If the Asymmetry control is 0, crosses are square, else rectangular. If positive, long axis of rectangle is parallel to pattern axis, else perpendicular to it.

Corrected Dots-Diamond
Squares to diamonds to wavy lines. Similar to ellipses but always having sharp corners. If the Asymmetry control is 0, square checkerboard pattern, else stretched squares. If positive, long axis of diamond is parallel to pattern axis, else perpendicular to it.

Corrected Dots-Elliptical
At 50% black, squares or diamonds, depending on Asymmetry. At high or low black, dots become circular or oval. High positive Asymmetry: line-like shapes, parallel to main pattern axis. At high negative, perpendicular to main axis.

Corrected Dots-Round
Standard halftone dots, going from small round dots at high or low black, tending to a square checkerboard near 50% black if Asymmetry is 0. At values near 50, black dots touch at smaller angles along thin tendrils, intended to compensate for midrange dot gain. At negative values, black dots touch more suddenly, which may give a ‘crisper’ impression.

Corrected Dots-Square
Black squares or rectangles on a white background. The exact inverse of the Cross dot. If the Asymmetry control is 0, crosses are square, else rectangular. If positive, long axis of rectangle is parallel to pattern axis, else perpendicular to it.

Corrected Lines
These are straight line patterns. For asymmetry 0, each side of line has same profile. For Asymmetry not zero, one side of line has a sharper profile than other, useful for certain effects where a visible sharp line edge is desired.

Coarse
Moving the slider over the Variation Windows to the right causes the increments to be more Coarse, meaning that there will be a greater difference, or step size, between the Current and the More parameter setting, and between the Current and the Less.

Current
The Variation Window showing a mini-preview of the Current setting of the parameter being varied.

Holding down the Command key on the Mac (Control key on the PC) and pressing the mouse button allows you to move the square in the Preview Windows which selects the area displayed in the Variation Windows.

Curvature
If zero, the Spokes radiate straight out from the center. If positive, Spokes become spirals moving clockwise as you go out from the center.

If negative, the spirals move counterclockwise as you get farther from the center. The amount of curvature also depends on the number of Spokes. Range: -300 to 300 (worms/inch).

Defaults
Clicking on the Defaults button opens up the Defaults dialog, and gives a choice of setting all parameters to their default values, or just a group of settings. This is a quick way of getting back to reasonable values if you have been experimenting with unusual settings.

Difference
A combination of a Mezzotint and a Pattern produced by subtracting one Pixel value from the other. See Mezzo + Pattern Difference.

Dot
A spot on a printed page or in a Bitmap, where the size and shape determines the darkness or Grayscale at that point in the image. If the dot is printed in black on a white background, then the larger the dot, the darker that spot in the image will be. Dots are usually arranged in regular patterns on the page, and the density is measured in Dots/Inch. For a Bitmap, the dot size should be at least four times larger than the resolution of the Bitmap, to reduce Posterization.

Dots/Inch
Number of Pattern Dots/Inch measured along either axis (tilted by Pattern Angle). Range: 1 to 300.

Dots-Circular
An Uncorrected Pattern Type consisting of a grid of circular dots. The area between the center of each dot and the Inner Radius is pure black. The area between the Inner Radius and the Outer Radius varies from black to white, and the area outside the Outer Radius is pure white. If the Outer Radius is less than or equal to the Inner Radius, the dots are pure black with sharp edges, and the Inner Radius is used for the size.

Dots-Round/Square
An Uncorrected Pattern Type consisting of a grid of dots similar to Halftone dots. With an average density of 50%, they have smooth transitions between black and white.

Ellipses-Smooth
An Uncorrected Pattern Type consisting of concentric circles or ellipses (ovals). Setting the Stretch to zero gives circles, and setting it to a non-zero value produces ellipses of a given eccentricity (or stretch). The Angle setting will tilt the ellipses, and has no effect on circles.

The center of the ellipses can be placed anywhere in the image with the Center X and Center Y sliders, the number of ellipses is determined by the Lines/Inch slider, and the Line Width may also be adjusted.

Ellipses-Wavy
This Pattern Type is the same as Ellipses-Smooth except that the circles or ellipses are wavy (sine waves). The waviness is controlled by the Wave Height: setting it to 0 eliminates the waves, and increasing its value accentuates the waves. The # Waves sets how many waves are in each ellipse.

Ellipses-Wavy & Sharp
This Pattern Type is the same as Ellipses-Wavy except that the waves are sharp (triangular waves) instead of being smooth (sine waves).

Enhance
To improve the quality of an image by increasing (or decreasing) its sharpness.

Enhanced Photo
Clicking this button in either the Left Window or Right Window column allows previews of the Unsharp Masking or Neighborhood Enhancement applied to the Input Photo before screening. If Enhance Photo is not checked, Enhancement is turned off and the Enhanced Photo preview will be identical to the Input Photo preview.

Enhance Photo
The Enhance Photo box allows selection of the Enhancement or “sharpening” of the original Input Image by one of two methods: Unsharp Masking or Neighborhood Sharpening. Either process can be used to sharpen or blur the input photo by an amount corresponding to the Amount slider value. Enhancement can be turned off to eliminate this step in the screening process (as in Standard Mezzotint Screening) by unchecking Enhance Photo.

When using Mezzo, Pattern, Blend or Difference screen, a crisper, sharper detailed screened image will be output because the Filter will as a default enhance the Input Photo. As a default, the Enhance Photo box is checked and the corresponding specified sharpening parameters are automatically applied to the Input Image before subsequent screening. Andromeda terminology for sharpened mezzotints is Mezzograms. You may turn off Enhance Photo to screen your gray scale photo to a traditional (standard) mezzotint.

To observe the comparative differences between the original photo and the enhanced photo, click on Input Photo in the Left Window column, and Enhanced Photo in the Right Window column. Please note that previews (and rendering) with Unsharp Masking Radius set to a high value (>20) are slower.

Expert
Click this button from Novice Mode to enter Expert Mode.

Expert Mode
A dialog in the Screens Filter which allows the user to individually set each parameter by moving sliders or typing in values, and previewing the different steps in the screening process. Expert Mode is entered from Novice Mode by pressing the Expert button.

Fine
Moving the slider over the Variation Windows to the left causes the increments to be more Fine, meaning that there will be a lesser difference, or step size, between the Current and the More parameter setting, and between the Current and the Less.

Grayscale
A Grayscale image is a continuous tone (contone) black and white image consisting of Pixels which can be any shade of gray. Although each Pixel can be anywhere from 2 bits to 16 bits, normally each Pixel is 8 bits (one byte), or 256 shades of gray. This is represented by the numbers 0 to 255, where 0 is black, 128 is 50% gray, and 255 is white. Sometimes percentages are used instead, where 0% is black and 100% is white. (You may see other programs or manuals where the numbers are reversed: 0 is white and 255 or 100% is black, but this is rare.)

Growth Rate
If 0, the growth rate is low, so that the Worms get bigger slowly farther from the origin. If 100, the growth rate is high.

(for XY Growth): The Mezzotint grows so that near the X axis, the stretched Worms are more or less aligned with the X axis, and similarly for Y.

(for Radial Growth A): The Mezzotint grows so that the stretched Worms 'point' toward and away from the origin; that is, they are stretched radially. Range: 0 to 100.

Halftone
A given spot on a page of a printed document either has ink or no ink; printing does not deal directly in shades of gray. Photographs or other material containing gray shades must therefore be converted to spots of pure black or pure white.

The usual method of doing this is called halftoning. A halftoned photograph consists of a regular grid of dots also called a screen. The screen or grid is made fine enough so that individual dots are inconspicuous to the eye. Typical halftone screens are from 85 Dots/Inch to 133 Dots/Inch. The number of Dots/Inch (also called Lines/Inch) is called the screen value.

Halftones simulate gray values by making use of limitations in the eye's resolution. Even though the eye will not see individual dots in the halftone, it will perceive their average brightness, or gray value, over a small area. If a particular small area in the original photo has pixel value of 230 (of a possible 255), it is 90% white and 10% black. It would be represented in the halftone as a series of small black dots, each occupying 10% of its grid cell, the rest of the grid cell being white. Because of its limited resolution, or ability to see fine details, the eye sees only the overall brightness of this small area, which is 90%.

If another area in the photo is 90% black, the halftone would be a white spot occupying 10% of its grid cell, the rest of the cell being white. If another area in the photo is 50% black, its halftone representation would be half black and half white in each cell. Magnified, this appears as a checkerboard, but to the eye, it just looks 50% white.

Halftones have been in use for many years and the technology is highly developed. Andromeda's Screen Filter provides an alternative to conventional halftoning by using randomized mezzo worm pattern as the dot shape, with variations in screen value, screen angle, and spot shape.

Halftone Dot
A Dot in a Halftone image.

Help
Clicking on the Help button displays on-line Help, which displays most of the information on Expert Mode found in the manual. Selecting a category at the top displays information about that category on the bottom.

While Help is active, all buttons and controls in the main filter dialog are disabled, including the Cancel button. You must click "Done" to get out of Help before doing anything else.

Host Application
The program that launched the Screens Filter. It must be able to run Adobe Photoshop™ compatible plug-in modules. Examples of Host Applications are: Photoshop, Debabelizer, Jag II, Premiere, Photopaint, Fractal Painter, Matisse, etc. (All names are trademarks of their respective companies.)

Image Resolution
This refers to the resolution, or dpi (dots per inch) of the Input Image from the Host Application. (This is not to be confused with the Dots/Inch of a dot pattern generated by the Screens Filter, which is the Screen Resolution.)

Image Size
This term refers either to the size in bytes of the Input Image, or the height and width of the Input Image. For gray scale, the size in bytes is the height in Pixels times the width in Pixels. For RGB color images the size in bytes is the height times the width times three; for CMYK color it is the height times the width times four.

If the image is compressed, it will take up less space on disk than the image size. When calculating memory usage, you must use the image size in bytes, not the size of the file on disk.

Inner Radius
Sets the size of the inside of the dot. Circular Dots are solid black from their center to the Inner Radius. From the Inner Radius to the Outer Radius, the dot density drops from solid black to solid white. Outside of the Outer Radius, the dot cell is pure white. The Outer Radius is constrained to be equal to or larger than the Inner Radius. Range 0-100 (% of dot cell size).

Input Image
The gray-scale or color image received from the Host Application when the Filter is started. If part of the image in the Host Application is selected when the filter is started, that selection becomes the Input Image.

Input Photo
Selecting this option for the Left Window or Right Window causes the original Input Image to be previewed. This is always what is displayed in the Left Window in Novice Mode.

Left Window
The large Preview Window in the upper left part of the Novice Mode and Expert Mode dialog. In Novice Mode the Input Photo is always displayed, and in Expert Mode, the display is selectable.

Less
The Variation Window showing a mini-preview of the Less setting of the parameter being varied.

Holding down the Command key on the Mac (Control key on the PC) and pressing the mouse button allows you to move the square in the Preview Windows which selects the area displayed in the Variation Windows.

Lines
A type of Pattern generated by the Screens Filter consisting of lines (rather than Dots or Worms). The lines may be straight, wavy, or elliptical.

Lines/Inch
This slider sets the number of Lines in each inch, traveling perpendicular to the family of Lines. The Lines/Inch is the screen value. Range: 1 to 300.

Lines-Straight
An Uncorrected Pattern Type consisting of parallel straight Lines.

Lines-Wavy
This Pattern Type is the same as Lines-Straight except that the Lines are wavy (sine waves). The waviness is controlled by the Wave Height: setting it to 0 eliminates the waves, and increasing its value accentuates the waves. The Wave Length controls many waves are in each line.

Lines-Wavy & Sharp
This Pattern Type is the same as Lines-Wavy except that the waves are sharp (triangular waves) instead of being smooth (sine waves).

Line Width
This slider sets the relative widths of the black and white portions of each Line, as seen in line profile or cross-section. At 50%, the Line profile goes straight from black to white and back down. If less than 50%, the black part of the Line is wider; if more than 50%, the white portion predominates. Range: 0 to 100 (% of line space).

Mezzo
Selecting Mezzo in the Select Screen box changes the type to Mezzotint. In the Mezzo box, a drop-down menu gives a choice of four Mezzo types: Uniform Mezzo, Mezzo XY Growth, Radial Growth A, and Radial Growth B.

Mezzogram. This is an Andromeda coined term for crisp Mezzotints, ideal for product advertising where detail is necessary. A Mezzogram screen is a Mezzotint screen applied to a sharpened gray scale image. (see also Enhance Photo & Mezzotint).

Mezzo+Pattern Blend (Mezzoblend)
Selecting Mezzo+Pattern Blend in the Select Screen box changes the type to a Blend, or weighted average of a Mezzotint and a Pattern. The Pattern Blend % slider appears, which controls how much Pattern and how much Mezzo will be used in the Blend: 0% is all Mezzo, 50% is half and half, and 100% is all Pattern.
Use the “Show controls for:” buttons to set controls for either the Mezzo Type or the Pattern Type. This allows efficient toggling to adjust the blend. To Preview either Mezzo or Pattern being used in the blend, you must click on the Mezzo or just the Pattern, and then reselect Mezzo+Pattern Blend when done previewing. You can also temporarily set the Pattern Blend % to 0 to see just the Mezzo, or 100 to see just the Pattern, and then set it back when done previewing.

Mezzo+Pattern Difference
Selecting Mezzo+Pattern Difference in the Select Screen box changes the type to a Difference of a Mezzotint and a Pattern.

Both the Mezzo Type and the Pattern Type must be chosen, and the "Show controls for:" buttons allow the user to set each one. To preview just the Mezzo or just the Pattern, select the Mezzo or Pattern buttons, and then reselect Mezzo+Pattern Difference when done previewing.

Mezzotint
Mezzotinting is an alternative to halftoning as a way to simulate gray values with a fine pattern of pure black and white. A mezzotinted photo consists of small, irregular shapes, rather than a regular grid of Dots. In light areas the mezzotint looks like small black shapes on a white background; dark areas have small white shapes on a black background. When viewed close up, the shapes look slightly like chromosomes or worms. Mezzotints, like Halftones, have screen values, which are given in terms of "Worms/Inch" in Series 3 Screens.

Mezzotinting is used more for special effects than for maximum photographic accuracy in reproduction. Frequently mezzotinting will be done at a Worms/Inch figure where the individual shapes can be perceived, giving a deliberately grainy or impressionistic effect, which can be somewhat mysterious looking. Mezzotinting is sometimes used in conjunction with deliberate blurring of the photo, and occasionally in conjunction with exaggerated sharpening. The Andromeda Screens Filter provides blurring and sharpening capability.
(See also Enhance Photo, Mezzogram)

Mezzo Type
There are five types of Mezzotints in the Screens filter. The Uniform Mezzo type corresponds to standard Mezzotints made by photographic means. The others provide special effects which are not available using photographic methods.

Each type is controlled by several sliders. For all mezzotint types except Uniform Mezzo, the sliders belong to one of two groups, denoted A Controls and B Controls.

Mezzo XY Growth
This screen is characterized by Worms that grow in size as they move away from the X and Y axes. The Mezzotint grows so that near the X axis, the stretched Worms are more or less aligned with the X axis, and similarly for Y.

Mix
The process by which the screen and enhanced photo are combined to make the output photo. In the mix, each pixel is a linear combination of the corresponding Pixels in the screen and the enhanced photo.

The Screens Filter creates a Grayscale image and blends it with the Input Photo to create the final Output Image. This created image is called the Screen. The Screen can consist of a Mezzotint, a Pattern, or a mix of the two.

Moire Effect
Pronounced moray, an undesired interference pattern produced by superimposing two repetitive patterns. In the Screens Filter, we try to avoid Moire Effects between the Screen pattern and the underlying Pixel structure of the Input Image, and also between the Pattern and the Mezzo when doing Blends. Moire Effects can be avoided by using Corrected instead of Uncorrected Pattern Types, and also by making sure that the Input Image is of high enough resolution.

When printing color images, the four CMYK layers are printed at four different angles chosen carefully to avoid Moire Effects, e.g. Cyan: 15 deg, Magenta: 75 deg, Yellow: 0 deg, Black 45 deg.

More
The Variations Window showing a mini-preview of the More setting of the parameter being varied.

Holding down the Command key on the Mac (Control key on the PC) and pressing the mouse button allows you to move the square in the Preview Windows which selects the area displayed in the Variation Windows.

Neighborhood Enhancement
This sharpening method is offered as an alternative to Unsharp Masking, which is normally used. Only the Amount is adjustable; the Radius is always one Pixel. It is a simpler, faster method, and will give good results for many images.

The default Amount is 100. Using high or negative values produce similar Artistic Effects as using these values in Unsharp Masking.

Novice
Click this button from Expert Mode to enter Novice Mode.

Novice Mode
A dialog in the Screens Filter which allows the user to easily choose settings from factory-installed or user-defined Presets. This is the initial dialog displayed when entering the Screens Filter. Novice Mode is entered from Expert Mode by pressing the Novice button.

OK
Clicking on the OK button saves the current settings and begins to apply them to the high resolution image stored in the Host Application. A progress bar appears to indicate the current status of the screening operation. The time it will take depends on the image size, the memory configuration, and the computer speed. The user may abort by clicking on the “Cancel” button next to the progress bar (or typing Command-Period on the Macintosh, Escape on the PC). The settings will be saved (to the Prefs file) even if the rendering is cancelled after clicking OK.

The “current settings” saved by clicking OK are used in two ways: (1) they are the initial settings the next time the Screens Filter is run (even if the Host Application is restarted), and (2) if the Screens Filter is applied to an image without running the user interface, these are the settings used.

In Photoshop™, after the Screens Filter has been applied the first time, the user interface can be bypassed with the “Last Filter” command at the top of the Filter menu (or by typing Command-F on the Macintosh, Control-F on the PC). To force the user interface to appear, hold the option key down on the Macintosh, or the Alt key on the PC while doing the “Last Filter” command.

After the Screens filter is done rendering the image, the user can use the “Undo” and “Redo” commands (Command-Z on the Mac, Control-Z on the PC), to toggle between the unscreened and screened images. Also, the “Revert” command will return you to the original image (as saved on disk).

Original
The Variation Window showing a mini-preview of the original Input Image at the location selected by the movable square in the Preview Windows.

Holding down the Command key on the Mac (Control key on the PC) and pressing the mouse button allows you to move the square in the Preview Windows which selects the area displayed in the Variation Windows.

Outer Radius
Sets the size of the outside of the dot. Circular Dots are solid black from their center to the Inner Radius. From the Inner Radius to the Outer Radius, the dot density drops from solid black to solid white. Outside of the Outer Radius, the dot cell is pure white. The Outer Radius is constrained to be equal to or larger than the Inner Radius. Range 0-100 (% of dot cell size).

Output Image
This is the final image prepared by the Filter and returned to the Host Application. This final image can be the Enhanced Photo by itself, the Screen by itself, a Mix of the two, or the Mix with a Threshold applied.

Output Image (Screen/Photo Mix)
The box containing controls which combine the Screen and the Enhanced Image to produce the Output Image.

Pattern
Selecting Pattern in the Select Screen box changes the type to Pattern. In the Pattern box, a drop-down menu gives a choice of fifteen Pattern types.

The Screens Filter can create a large number of geometric or algorithmic patterns. Some possibilities are: arrays of dots of several kinds; arrays of straight or wavy lines; families of concentric circles or ellipses, either smooth or wavy; and spokes or spirals. The waves in the lines and ellipses can be sinusoidal or sharp.

Pattern Blend %
This slider controls how much Pattern and how much Mezzo will be used in a Mezzo+Pattern Blend: 0% is all Mezzo, 50% is half and half, and 100% is all Pattern.

Pattern Type
There are fifteen types of Patterns in the Screens Filter. Each type is controlled by several sliders. There are six Corrected Patterns, and nine Uncorrected Patterns. Corrected Patterns minimize Posterizing and Moire effects, and perform better than the others when used alone, as opposed to in a Blend. Uncorrected Patterns have more variety and more range in their parameter settings, and are most useful in Blends with Mezzos or for creating Artistic Effects.

Pixel
A “picture element”, the basic unit or “spot” in an image. In a computer, each pixel is represented by anywhere from 1 to 64 bits. Normally, a bitmap (binary) image is one bit per pixel, a Grayscale is 8 bits (1 byte), an RGB is 24 bits (3 bytes), and a CMYK is 32 bits (4 bytes).

Pixels may also be represented by Indexed Color, where each pixel is usually represented by 8 bits, and each of the 256 possible values refers to a color in a Color Lookup Table. The Screens Filter only works with Grayscale, RGB, and CMYK.

Pixels/Inch
In this manual, this term is used to refer to the Input Resolution, or the dpi (dots per inch) of the Input Image from the Host Application.

Posterization
The effect on a Grayscale or color image when a limited number of shades of gray or colors are used to represent the image.

For example, if you take a continuous tone Grayscale image represented by 256 shades of gray and force the value of each Pixel to be a multiple of 10, the image will now only have 26 shades of gray instead of 256. The image will therefore look “posterized”, that is there will be patches of distinct shades rather than smooth, gradual transitions.

Posterization is usually undesirable, although some artists produce this effect intentionally. To avoid it when using the Screens Filter (or any Halftone Dot generating process), make sure your Input Resolution is at least four times higher than your Screen Resolution. The higher this ratio, the more shades of gray will be available, since there will be more Pixels per Screen Dot, and therefore a greater number of possible Dot sizes.

Preset
A named group of parameter settings. The sliders are set in Expert Mode and then named and saved in Novice Mode.

Preview Windows
The two large image display windows in both Novice Mode and Expert Mode, referred to as the Left Window and the Right Window. In Expert Mode, each window may be used to display any of the four steps in the Screening process.

The Preview Windows may be independently zoomed and panned, or they may have identical magnifications and positions if the Sync button is checked.

The square displayed inside both windows shows the current position of the view in the Variations Windows. This square can be moved by holding down the Command key on the Mac (Control key on the PC) and dragging the box. Otherwise clicking the mouse over the Preview Windows zooms in, and Option-clicking zooms out on the Mac (Alt-clicking zooms out on the PC). Clicking the small square on the bottom right (which displays the zoom level) does a fit-in-window.

Radial Growth A
This screen is characterized by Worms that grow in size as they move away from the center. The Mezzotint grows so that the stretched Worms 'point' toward and away from the origin; that is, they are stretched radially. There is a slider to control the Growth Rate.

Radial Growth B
This screen is characterized by Worms that grow in size as they move away from the center, in a stretch pattern controlled by the Stretch Factor slider.

Radius
Unsharp Masking sharpens by taking each Pixel in the image, examining the Pixels surrounding it, and modifying its value (according to the values of the Pixels close by). The Radius slider controls the size of this neighborhood. Increasing the Radius means that the program will examine a larger area when sharpening each Pixel. A larger Radius also causes the program to run slower, and may cause unwanted artifacts to appear in images with features or details which are smaller than the Radius.

For most images, dividing the resolution by 60 gives a good value for Radius. For example, 5 pixels is adequate for a 300 dpi image. Another method for setting the Radius is to examine an area where two different colors or definite shades of gray meet. There will be a fuzzy transition area of “in between” shades. The radius can be set according to the width (in pixels) of this area, although some experimentation will be necessary to get the best value. Range: 1 to 100 (pixels).

Resolution
The number of Pixels/Inch of an image. Higher resolution means better quality, but it also means more computer resources and processing time are required. If an image is less than about 300 dpi (dots per inch), it is considered low resolution. Most desktop printers and scanners are 300 dpi or higher, and magazine quality is 1000 dpi or higher. Computer monitors are generally in the ranger of 60-100 dpi, but by zooming in an application program, portions of images can be magnified to see the same detail that high resolution printers can use.

You need to be concerned about resolution when using the Screens Filter to make sure that the Image Resolution is high enough to produce high quality output. Your printer resolution should be at least as high as your Image Resolution, and your Image Resolution should be at least four times higher than your Screening Resolution (see Section 3.3 for the “4:1 Rule”)

RGB
A three color image consisting of Red, Green and Blue layers. Each layer is usually an 8-bit Grayscale, so each Pixel requires 24 bits (3 bytes) of storage.

A color image must be converted to CMYK before printing on a printing press. Images are normally scanned and displayed on the computer screen in RGB. The RGB->CMYK conversion may be done by the Host Application (before or after applying the Screens Filter), or it may be done later by some other program, or by the printer driver.

RGB colors are additive; any color (including white) can be produced by the three primary colors: Red, Green, and Blue. RGB is easier to work with than CMYK for the graphic artist, and requires less storage.

Right Window
The large Preview Window in the upper middle part of the Novice Mode and Expert Mode dialog. In Novice Mode the Output Image is always displayed, and in Expert Mode, the display is selectable.

Screen
A Mezzotint, Pattern, or a combination of the two using Blend or Difference.

Screen %
This slider controls output contrast. Less screen percent shows more image and less screen (higher contrast), and more screen percent shows more screen and less image (lower contrast). 100% produces an output image with just screen, and no original image. 0% produces an output image with just enhanced image, and no screening. Normally, values around 50% are used. Range: 0 to 100.

Screening
The process of generating or applying a Screen.

Screening Resolution
This term refers to the Worms/Inch, Dots/Inch or Lines/Inch used to generate the Screen in the Screens Filter. It does not have anything to do with your computer screen! The Screening Resolution should be at least four times lower than the Image Resolution for good quality output. (See Section 3.3 “4:1” Rule & Other Tips for Good Screening)

Select Screen
This box contains the controls for selecting the general screen type.

Sharpening
An Enhancement which makes an image appear in sharper focus.

Show Controls for
For Mezzo+Pattern Blend and Mezzo+Pattern Difference, this allows the user to select whether to set the parameters for the Mezzo part of the Blend, or the Pattern part.

Special Mezzo
This checkbox only appears when the Input Image is CMYK color, and Uniform Mezzo is being used. Checking Special Mezzo causes the Black layer to have its Worms/Inch doubled (the Cyan, Magenta, and Yellow layers are unaffected). Doing this improves the output quality for some images.

Spokes
This Pattern Type consists of lines radiating outward from the center, where the lines get thicker as they go outward.

The center of the pattern can be placed anywhere in the image with the Center X and Center Y sliders, the number of spokes is determined by the # Spokes slider, and the Line Width may also be adjusted. A Curvature of 0 yields straight spokes, and non-zero values curve the spokes.

Stretch
For ellipses, setting the Stretch to zero gives circles, and setting it to a non-zero value produces ellipses of a given eccentricity. Positive values of Stretch elongate the ellipses on the X-axis, negative values on the Y-axis. The ellipses can also be rotated with the Angle Slider.

Stretch Factor
(for Radial Growth B): If the setting is less than 50, the Worms are stretched tangentially. If the setting is more than 50, the Worms are stretched radially. If equal to 50, the individual Worms are not stretched, but the overall pattern expands linearly with increasing distance from the origin. Range: 0-100.

Sync
If checked, all zoom and pan operations done to one of the Preview Windows is also done to the other, so that both Window A and Window B have the same view. If not checked, the two Preview Windows can be zoomed and panned independently.

Threshold
Threshold is a general term for converting a Grayscale value into a black or white value by comparing it with a cutoff number. For example, if the cutoff is 128, all Grayscale values in the range of 0-128 are turned black and all values in the range of 129-255 are turned white. Threshold is also the name of the checkbox in the Screens filter which turns this conversion on or off, and the name of the slider controlling the cutoff value if conversion is on.

The Threshold checkbox must be checked to have the Screens Filter produce output consisting of black or white pixels, rather than shades of gray. You may uncheck Threshold to produce continuous tone grayscale output, if you wish to Threshold it later in the Host Application, or have some other requirement for Grayscale output. If Threshold is checked, the Threshold slider sets the Threshold level, or cutoff.

Uncorrected
Uncorrected patterns do not have the optimum Grayscale distribution in each pattern cell, or necessarily have identical pattern cells. Therefore they will not generally give as good Grayscale renditions, and may introduce Moire and Posterizing effects when used as Screens. They are useful because they have more variety and more range in their parameter settings. They are most useful in Blends with Mezzotints, and may not make a satisfactory Screen when used alone. They can be used for many interesting special effects.

Uniform Mezzo
This is the traditional true Mezzotint Screen. The “wormy” pattern is the same as that achieved by the traditional high quality photographic screening process.

Unsharp Masking
In spite of its name, this is a sharpening procedure. (The name is an industry standard and is a bit misleading.) It is used to make edges in the Input Photo appear sharper, or more in focus, before any Screen is applied. Its operation is somewhat similar to Neighborhood Sharpening, but is more powerful, having an adjustable Radius parameter, and a weighted rather than uniform average over the neighboring Pixels. Unsharp Masking in this filter is similar to Unsharp Masking operations in other image manipulation programs such as Photoshop™.

Different values of the Amount slider produce different effects, as follows:

Amount Slider	Effect
less than -100	Haloing or ghosting (special effect)
-100	Pure blur
-99 to -1	Combination of blur and original
0	Original, unmodified
1 to 100	Combination of sharpening and original, original weighted more
greater than +100	Combination of sharpening and original, sharpening weighted more.

Variation Windows
Variations of any slider value in Expert Mode can be done in the Variation Windows by clicking on the specific slider name. When the slider has been selected in this manner, a short underline appears under the slider name to show it has been selected.

Also, the name of the selected slider and its current value appear above the fine-course slider at the top of the Variation Window.

Clicking on the More Window increases the selected slider's value; clicking on the Less Window decreases it. The amount of increase or decrease is controlled by the Fine-Course slider above the Variation Windows. Holding down the Command key on the Mac (Control key on the PC) and pressing the mouse button allows you to move the square in the Preview Windows which selects the area displayed in the Variation Windows.

Wave Controls
Allows user to set wave characteristics for wavy patterns.

Wave Height
This slider sets the height in Pixels of each wave, from topmost peak to bottommost peak. If 0, the Lines or Ellipses are smooth. For more positive values, the waves are larger. If Stretch is nonzero, the waves are stretched. Range: 0-400 (pixels).

Wave Length
This slider sets the distance in Pixels from the peak of one wave to the peak of the next, measuring parallel to the Lines. Range: 0 to 500 (pixels).

Worms
This term refers to the small, irregular shapes which make up the Mezzotints produced by the Screens Filter.

Worms/Inch
This setting determines how fine the Worm pattern is. A Mezzotint of a given value of Worms/Inch corresponds roughly in fineness of detail to a halftone screen of equal Dots/Inch. It is highly recommended that the Worms/Inch slider value be less than or equal to 25% of the dpi value of the original Input Photo, to produce good quality output. Range: 1-100.

X Offset
Increasing this setting will move the entire Worm pattern to the left, and decreasing will move to the right. Range: 0 to 100.

X Origin
For ‘Growth’ Mezzotints, the Worms/Inch slider determines how many Worms/Inch there are at the origin. As you get farther from the origin, the Worms are bigger. The origin can be anywhere within the bounds of the photo. For X origin = 0, the origin is at the left edge; for 100, it is at the right edge. Range: 0 to 100 (% of pic width).

Y Offset
Increasing this setting will move the entire Worm pattern upward, and decreasing will move downward. Range: 0 to 100.

Y Origin
For Y=0, the origin is at the top edge of the pattern; for 100, it is at the bottom edge. Range: 0 to 100 (% of pic height).

Zoom In/Out
Clicking the mouse over the Preview Windows zooms in, and Option-clicking zooms out on the Mac (Alt-clicking zooms out on the PC). To see the screened output image, it is best to Zoom in at 1:1 (see lower right corner of each window for magnification status “:3” indicates “1:3”, “1:” indicates “1:1” and so on). Clicking the small square on the bottom right does a fit-in-window.

6.0 Screening Sessions

Each Screening Session is a working tutorial on how an artist used Series 3 Screens to achieve a desired look. The gallery of images generated in each session provide valuable visual insight into the filters capability.

6.1 Mezzotint Screening Session.

Artist: Guy McCool (Thousand Oaks, California)

Image: GABE Image (600 dpi)

Objective: To achieve a dramatic "impressionistic" expression in the GABE image.

Screen: Mezzotint

Method:
1. A 600 dpi gray scale image was used since it allowed experimenting across a 35 to 150 lpi screen ruling range. (The 600 dpi Input Photo complies with the 4:1 rule for Mezzotint Screening, see section "Rules and Tips for Good Screening" in this manual)
2. The selection of the Mezzotint screen(lpi) was based on a subjective process rather than any print run requirements.
3. To optimize the selection process, Novice Mode was used to generate a comparative gallery of images for subjective evaluation.
4. The selected image was further refined in Expert Mode.

Procedure:
1. In Novice mode, the 65 lpi Mezzotint preset was selected as a convenient starting point. The Lines Per Inch menu was used to generate a gallery of comparative mezzotints at 45, 65, 100, 133, 150. Each "lpi" was viewed in the Preview Window image at 1:1 magnification and some were output to a 600 dpi laser printer to check overall look.

Input Image 600 dpi

Output Mezzotint Screen 45 lpi

Output Mezzotint Screen 65 lpi

Output Mezzotint Screen 100 lpi

Output Mezzotint Screen 133 lpi

Output Mezzotint Screen 150 lpi

Gallery of comparative mezzotint images. Artist favored the 100 lpi image.

Andromeda Series 3 Screens

2. Narrowing the selection was based on a subjective evaluation. The Preset Mezzotint 45 lpi and 65 lpi were too coarse, since the artist was looking for a finer and softer look in the GABE image. The Preset Mezzotint 133 lpi and 150 lpi screens were too fine and almost photographic. The Preset Mezzotint 100 lpi was closest to the desired look. A final decision was made by evaluating 600 dpi laser printer output of the 95, 100, and 105 lpi screened GABE image. To print a screened image, the artist changed Mode in Photoshop from Grayscale to Bitmap selecting the 50% Threshold option. This dropped the file size from 1.4 MB to 180K Bytes without affecting the screen quality and saved time in the printing process. The artist chose a custom 105 lpi Mezzotint setting.

3. Next, the Variations Window in Novice Mode were used to evaluate various threshold values. The threshold value set by the Mezzotint Preset was 119 (as noted on top the slider above of the Variations Windows). Each click on “Less” (Variations Window) moved the threshold value down by 5. The resulting image showed that a highlighted area, such as the cheek, became "washed out" (no screen): note Figure 1. Each click on “More” (Variations Window) moved the threshold value up by 5. Although this filled in the highlighted areas, such as the hair, it "plugged up" (blackened) the shaded areas ; note Figure 2. The Mezzotint Preset 119 threshold setting turned out to be the best choice.

Figure 1

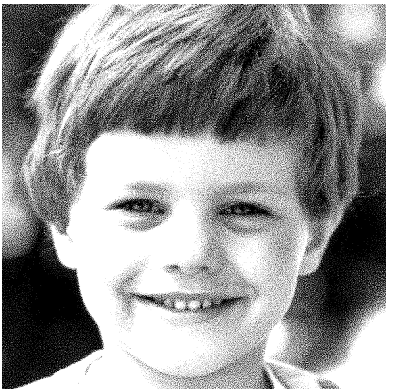
105 lpi, Threshold at 105

Figure 2

105 lpi, Threshold at 128

Threshold values below 119, i.e ... "washed out" highlight (cheeks) area-Figure 1, while Threshold values above 119, i.e. 128 and higher, "plugged-up" shadow (hair) area-Figure 2.

4. With Mezzotint Screen set at 105 lpi and Threshold set at 119, the artist entered Expert Mode to increase refinement with the Screen % slider. The filter default is Screen 50%. Less Screen % shows less screen and more image (higher contrast), and more Screen % shows more screen and less image (lower contrast). The objective was to show more screen, compromising on the contrast in order to fill in the washed out cheek areas. 55% Screen was selected, see lower right image.



105 lpi, 119 Threshold, Screen 40%

105 lpi, 119 Threshold, Screen 55%

The Final Mezzotint Image. 105 lpi, 119 Threshold, 55%Screen

5. After the Filter completed screening, the Mode of the screened image was changed in Photoshop from Gray Scale to Bitmap with 50% Threshold option. This fully converted the image to a pure black and white line-art document (no gray scale values). After Bitmapping, the line-art, was approx. 1/4 size of original gray scale photo. The advantage of small size was quick hardcopy proofs or camera ready art on a 600 dpi laser printer.

6.2 Mezzogram Screening Session.

Artist: Andromeda Art Dept., Thousand Oaks, CA. USA

Image: Popcorn Box 600 dpi gray scale

Objective: Mezzotint the Popcorn Box (Input Photo) for commercial product advertising at 85 lpi: type should be more legible and image should show product detail.

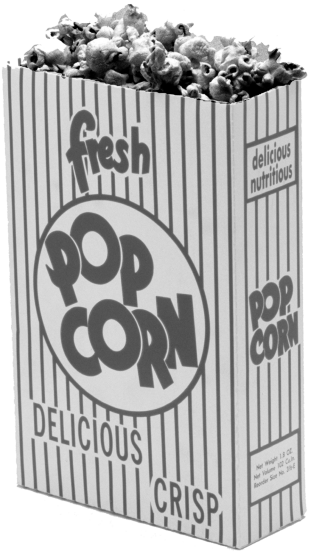
Method:

1. Using the 4:1 rule, the input image should be at least 85 X 4 = 340 dpi. Since higher resolution is preferred, a 600 dpi image will be used.
2. Use the Mezzogram screen to generate a sharp crisp Mezzotint.
2. A gallery of comparative Mezzogram images for evaluation will be generated in Novice Mode.
3. The image will be refined in Expert Mode.

Procedure:

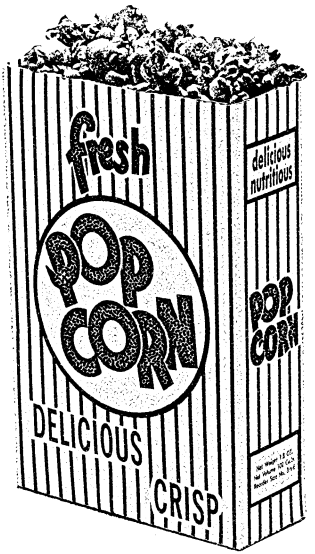
1. First select an 85 lpi Mezzotint preset in Novice Mode. Then select an 85 lpi Mezzogram preset. You will see the image in the Preview Window sharpen dramatically in detail. (View the screened output image in Preview Window at 1:1 magnification). It is quite evident that Mezzogram screening will bring out the detail in the Popcorn box. The remaining session is an exercise in determining the degree of sharpness and contrast suitable for the image. It is best to compare printed output. Before printing screened image from the filter, change the Mode in Photoshop to Bitmap with 50% Threshold option. Do not scale the image. (Scaling the image may pixelate or stretch or shrink the screened dot shape).

Compare these images to see the differences between the Mezzotint and the Mezzgrams. Note that the Mezzograms are sharper and show more detail. Even at low screen ruling (lpi) such as 45 lpi shown in bottom left image, a Mezzogram will bring out crisp detail. The 85 lpi Mezzogram has a smaller worm pattern thereby creating finer detail.

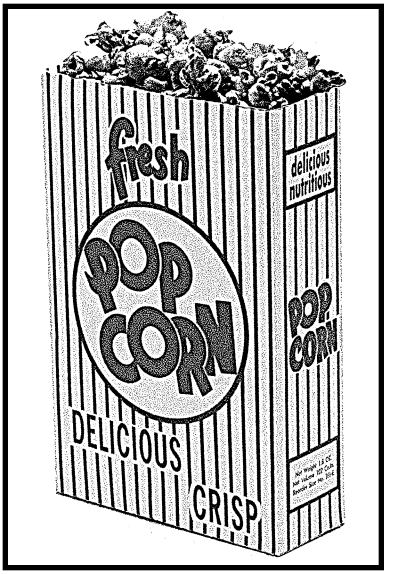


600 dpi Input Photo

Mezzotint Screen 85 lpi



Mezzogram Screen 45 lpi

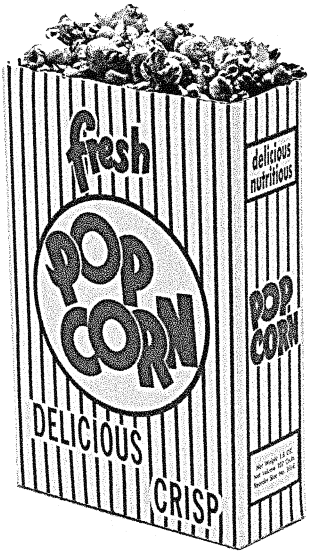


Mezzogram Screen 85 lpi

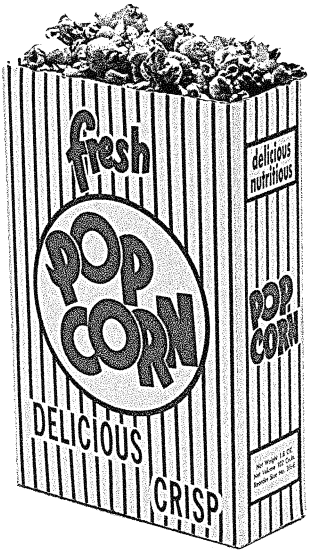
2. The sharpness in Mezzogram screening is due to Unsharp Masking being applied to the Input Photo. The default for the Filter is 350. The artist experimented with various unsharp mask values before selecting 500.

85 lpi, Unsharp Mask 50

85 lpi, Unsharp Mask 150

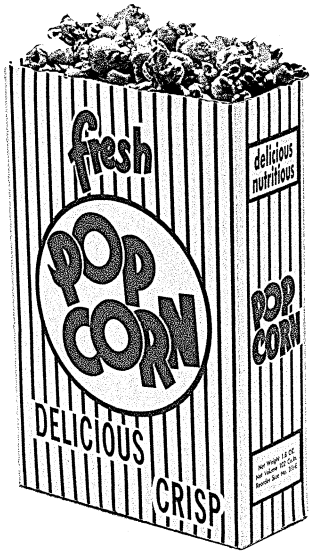


85 lpi, Unsharp Mask 300

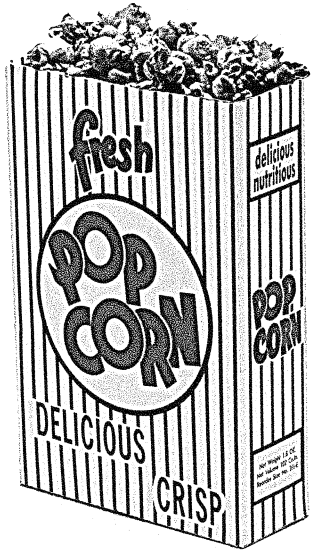


85 lpi, Unsharp Mask 500

3. At this stage a Mezzogram of the Popcorn screened has the following settings: 85 lpi Mezzogram, Unsharp Mask 500 (filter default for Mezzotint & Mezzogram Presets), Threshold 119 (filter default for Mezzotint & Mezzogram Presets), and Screen 50% (filter default). Although the detail due to sharpening is quite good, higher than 600 dpi Input Photo and higher screen ruling i.e.133 or 150 lpi, will bring out better image detail. However we cannot increase the screen ruling since the image must be screened at 85 lpi for newspaper printing. This step experiments with increasing contrast to improve existing detail. Decreasing Screen % from 50% to 45% shows more image and less screen (higher contrast). The artist decided that 45% Screen increased contrast by making the lettering blacker and more legible.



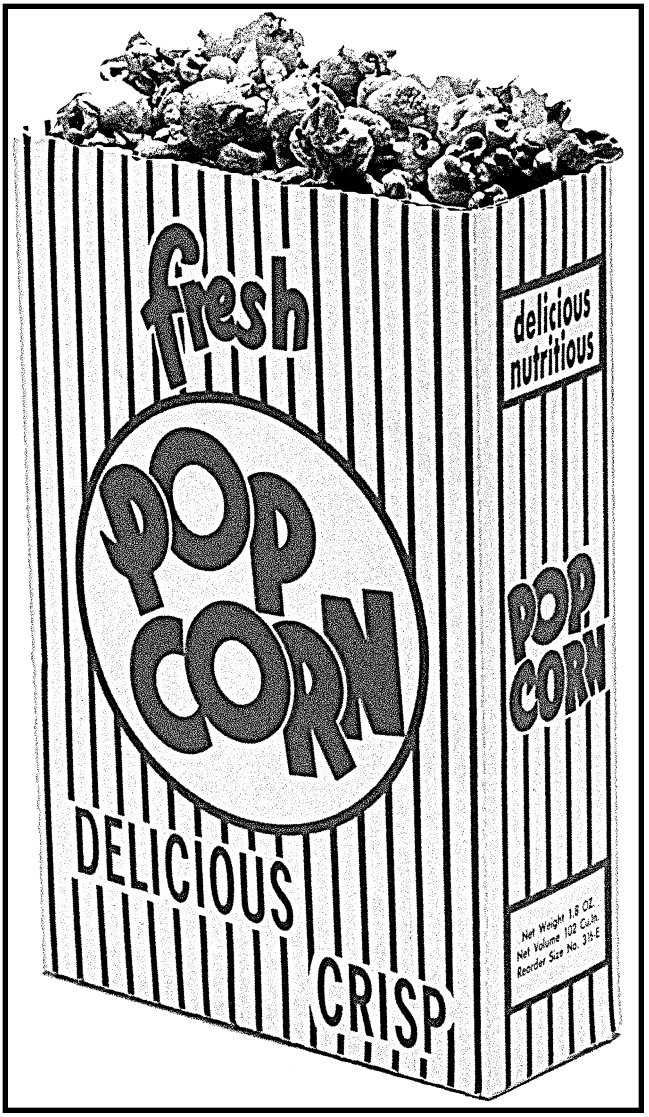
45% Screen



50% Screen(Filter Default)

(The artist did increase Screen % over 50%, causing more screen pattern to break into the image detail therefore lowering contrast; 100% Screen shows only worm pattern and no image!).

Shown below is the final image: 85 lpi Mezzogram, Unsharp Mask 500 (filter default for Mezzogram Presets), Threshold 119 (filter default for Mezzogram and Mezzotint Presets) and a modified 45% Screen. You can get this setting by selecting a 85 lpi Mezzogram Preset from Novice Mode and then modifying the Screen % from 50% to 45% in Expert Mode.



A Mezzogram of the Popcorn Box is ideal for product advertising since all the relevant features are sharp and legible. For production the image is easy to handle since it is screened and therefore camera ready on the desktop.
The file size of screened image is approx. 950K bytes in Photoshop, while the original gray scale photo was 7 MBytes! The smaller file size makes it quicker to print, transfer and modem.

6.3 Mezzoblend Screening Session.
Note: There are a number of exquisite Mezzoblend Presets (ready to use screens) in Novice Mode Preset Menu.

Artist: Andromeda Art Dept., Thousand Oaks, CA USA

Image: 600 dpi gray scale photo

Objective: To screen a gray scale photo with a unique texture. Printing requirements dictate that the screen ruling cannot exceed 133 lpi.

Screen: Blend of Mezzogram (Mezzo) + Lines-Straight (Pattern)

Method:

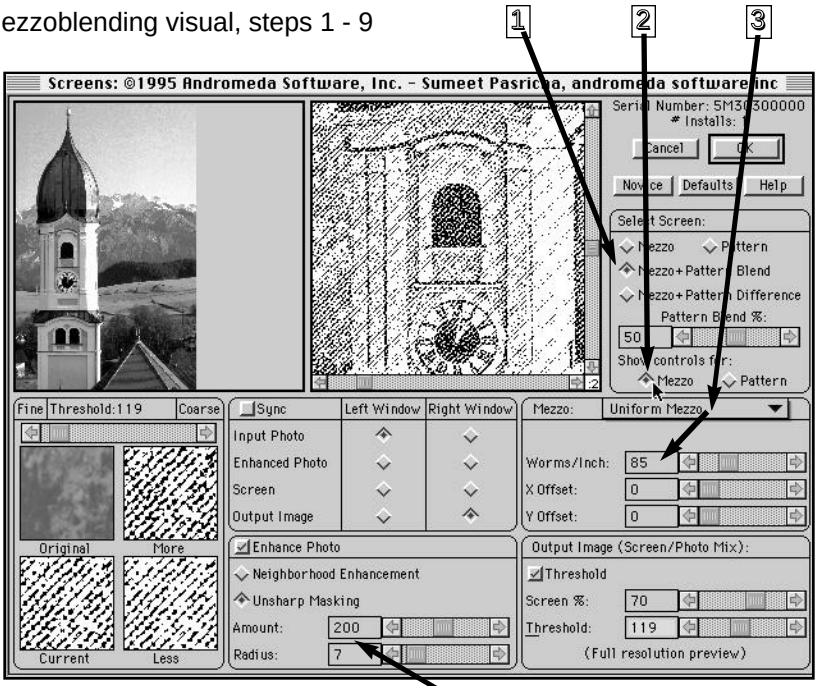
1. The Input Photo must be at least 532 dpi i.e. 133 X 4. Since higher resolution is OK, use a 600 dpi Input Photo to bring out better image detail.
2. The Mezzoblend Presets in Novice Mode will not be used in this session, the process of discovering a new blend of a mezzo and a pattern screen will be done in Expert Mode.

Procedure:

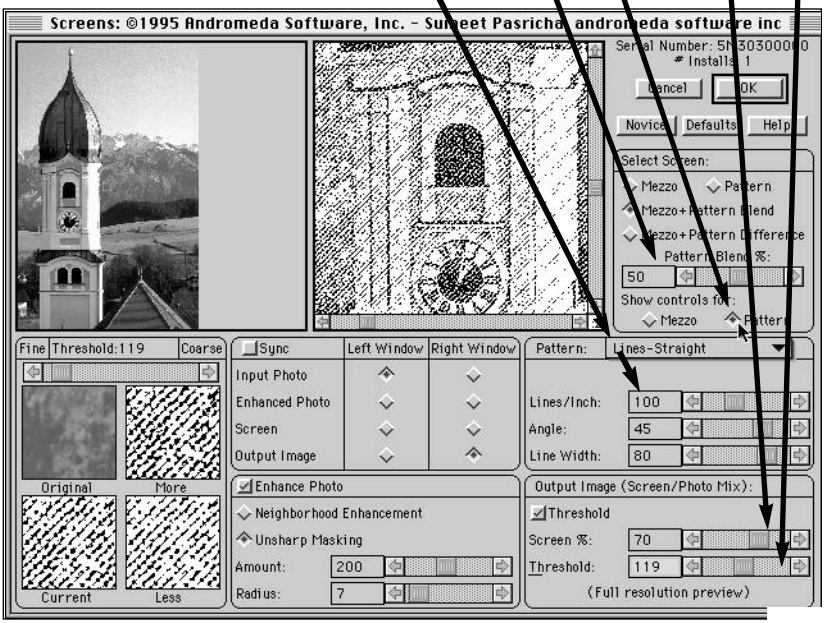
(See “Mezzoblending visual, steps 1 - 9” next page.)

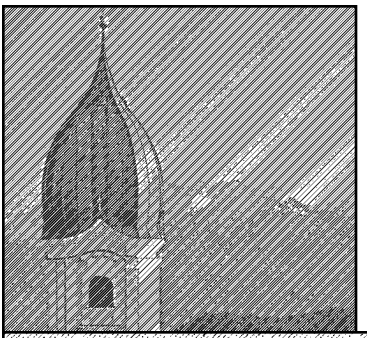
1. Click on Mezzo + Pattern Blend in Expert Mode.
2. Click on "Show Controls For ... Mezzo", to select a mezzo.
3. Select Uniform Mezzo as the mezzo pattern, adjust the Worms/Inch. The artist settled on 85.
4. Adjust the Unsharp Masking to desired sharpening. The artist softened the sharpening down from 350 (default) to 200.
5. Click on "Show Controls For ... Pattern", to select a pattern.
6. Select Lines - Straight as the pattern, select the Lines/Inch, Angle and Line Width. The artist settled on 100 lpi, 45 degrees and 80 Line Width. The high Line Width was favored to show finer line pattern
7. Leave the slider for Pattern Blend slider at 50%, so that the selected mezzo and pattern will be blended at 50% each.
8. The blended screen is then mixed with the Input Photo at 70% screen (and therefore 30% of Input Photo). The high screen % used by the artist was to accentuate the blended screen
9. The screen and photo mix is then thresholded at 119.

Mezzoblending visual, steps 1 - 9

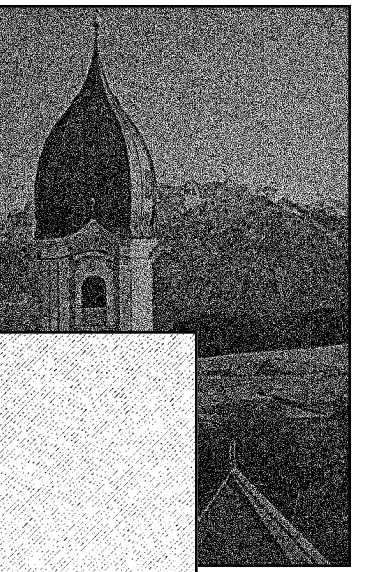


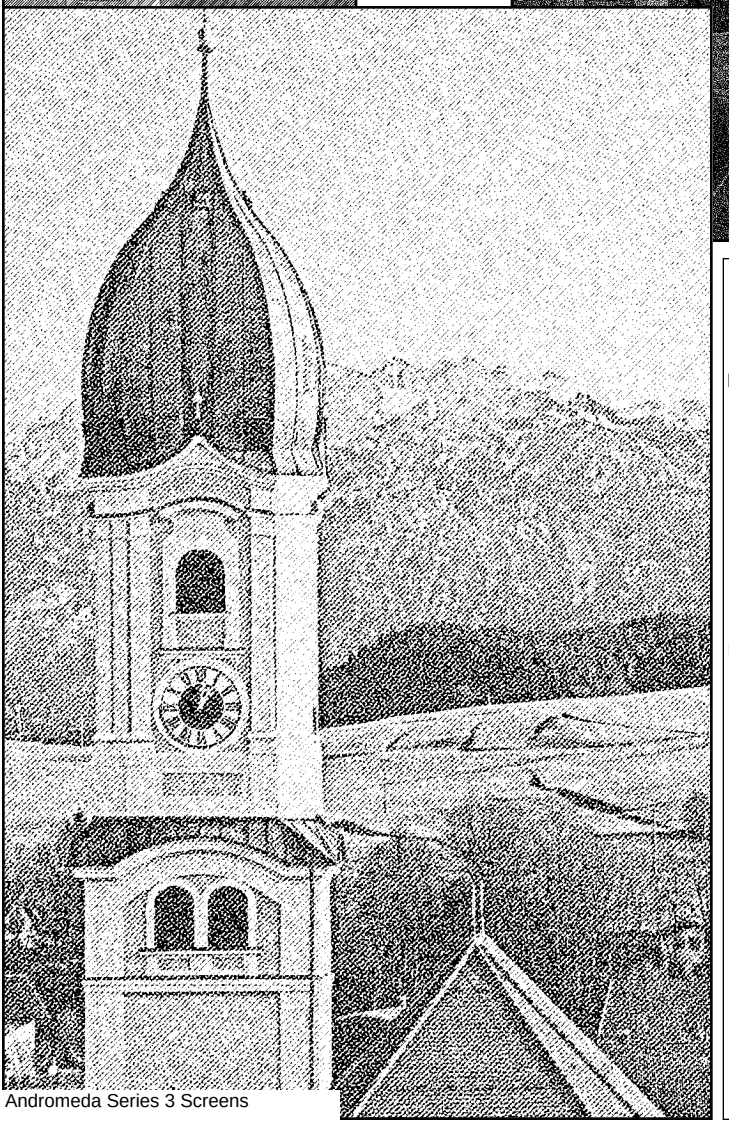
The Preview Windows will show blended screening results immediately, making it efficient to experiment and discover new blends.





(lt)Straight Line Pattern (100 lines/inch)
+
(rt) Uniform Mezzo (85 worms/inch)
=
100 lpi Mezzoblend





The insets above show a Straight Line and a Mezzo screen. The large image on the left shows the blended result. The tonal quality & pattern is biased due to 70% blend of the Straight Line Screen.

Original Input Photo was 600 dpi. The screening was done at 600 dpi. After screening the resolution was changed to 300 dpi using Image Size (in Photoshop) with File Size Checkbox **on** to prevent scaling & re-sampling. The screening was preserved. Do not scale a screened image.

Andromeda Series 3 Screens

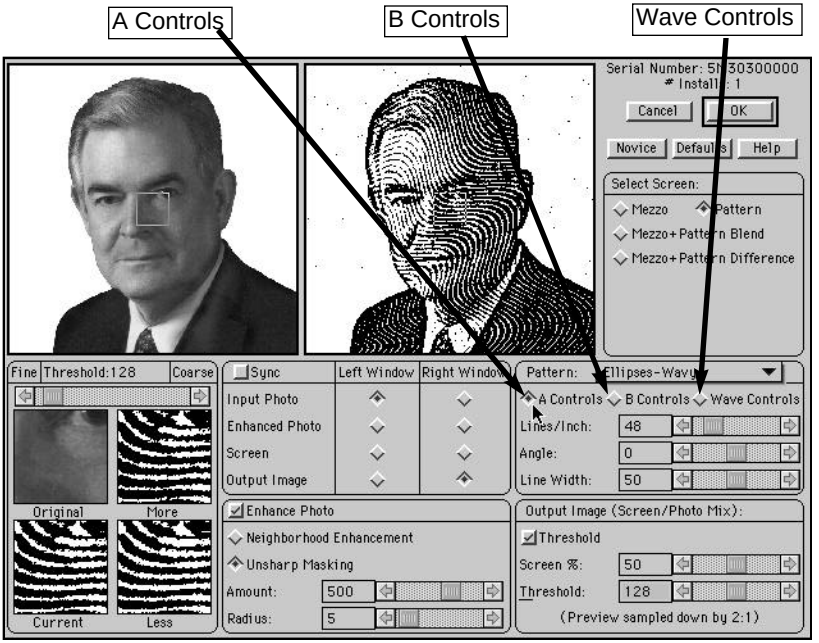
6.4 Engraving Session

Artist: Barry Burns, Westlake Village, CA USA

Based on an understanding for the look and feel of an etching and the technical and artistic limitations found in traditional engravings, the artist used Series 3 to convert a grayscale image to the look of an engraving.

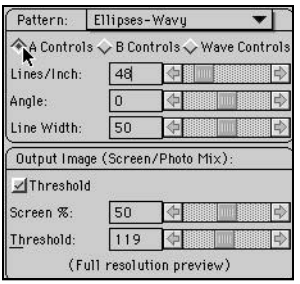
Step 1. He started with a 600 dpi grayscale photo and used the Dodge and Burn tool in Photoshop to increase the overall highlight and shadow tones before using the Magic Wand to select the background area. See figure on the right. He then inverted the background selection which reversed the selection to include only the head and body.

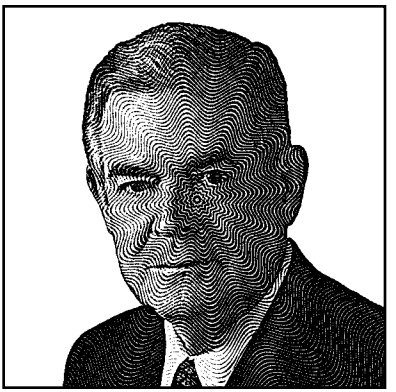
Step 2. Barry entered Expert Mode and clicked the Default button and selected ”All Settings”. In the Select Screen window, he then selected "Pattern" as the screen type and chose the "Ellipses-Wavy " setting.



Engraving controls used by artist in Expert Mode

Step 3.

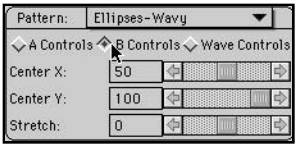




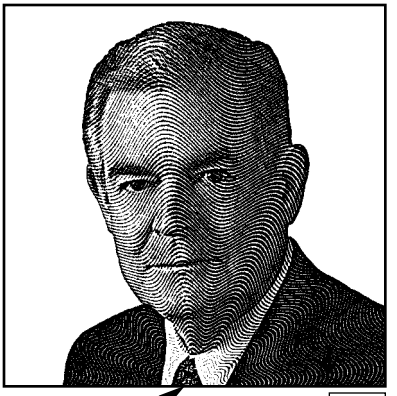
Step 3

Clicking the "A" control, with the right Preview Window set at 2:1, Barry adjusted the Lines/Inch slider to a "48" setting, which he felt reflected the average number of lines per inch typically used in an etched portrait of this size. The Threshold slider was set at 119.

Step 4.



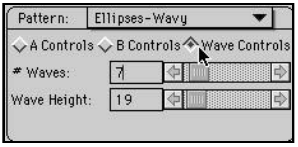
Clicking "B" button, he adjusted the Center Y slider to setting 100 which positioned the bulls eye to the bottom of the selection.



Center of Bulls Eye

Step 4

Step 5.

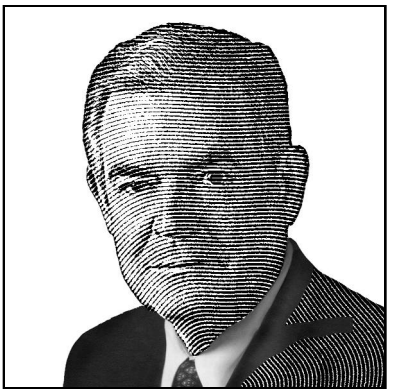


Clicking the “Wave Controls” button allowed him to pick #Waves and Wave height ; In # Waves he set the slider to "7". This created the proper number of contours across the face. Barry next selected a Wave Height setting of “19” which allowed the lines to follow the facial contours. He then clicked OK button to screen the image.

Step 5

Step 6.

Next, he used the Magic Eraser with the "Erase To Saved " box checked to restore the gray scale to the Clothing .



Step 6

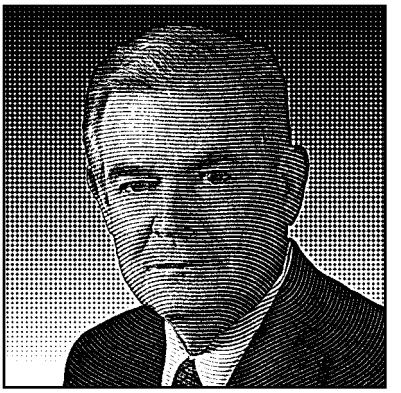
Step 7.

Having restored the clothing with the magic eraser he re-selected the restored area and sent it back into the filter (by selecting Screens again). With the Series 3 Expert Mode dialog box open, Barry navigated back to Ellipse-Wavy "B" control setting, and adjusted the “Y” slider to setting “0”. This positioned the bullseye toward the top of the selection and without changing any other settings.

Step 7

Step 8. (optional)

Barry then decided that the portrait image should stand out from the background in the tradition of 19th Century engravers. He used the Magic Wand to select only the background in order to apply a gradient before returning to the filter. To complete the conversion, Barry returned to “Select Screen” and chose a Diamond Pattern rather than a linear one.



Step 8

After completing the engraving session, back in Photoshop, Barry changed Mode from Gray Scale to Bitmap (50 % Threshold) to significantly cut down the file size.

Although unnecessary, the process could have been expanded to include separate, more detailed selections such as eyes, nose, ears, and lips, etc. Because the detailed approach can become difficult to control as a total image, the larger selection method presented in this session can significantly simplify the process.

The final Engraving Session image

6.5 Text Screening Session

Note: There are a number of spectacular Text Effects Presets, ready to use text effect screens, in the Novice Mode Preset Menu.

Artist: Andromeda Art Dept., Thousand Oaks, CA USA

Image: 600 dpi bitmap text that filled with midtone gray tint.

Objective: Influencing text screening with tonal variations

Procedure:

In screening text, it's just as important to follow the same guidelines as found in section 3.3 "Rules and Tips for Good Screening", particularly the 4:1 rule, to insure proper output.

The most effective screened text will be that which offers bold characters with larger surface areas.

The greater the tonal variance across the surface of the individual characters, the more effective the filter can be in applying its effects.

Flat mono-toned character surfaces can be given more tonal range by using some of the following methods:

a. Start with gray scale characters that are filled with gray scale tint. (Preferably midtones). Save the text selection in a channel.

A-1

b. In Photoshop, utilize Dodge and Burn tool on text characters with a midtone gray tint to increase tonal variety (B-1), Save the image.

B-1

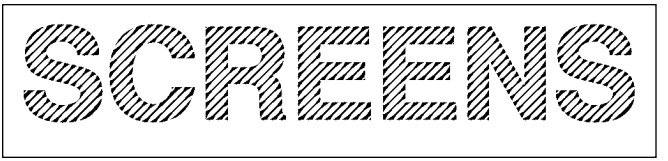
c. In Photoshop, starting with A-1, use the Airbrush in shading specific areas within, or on the edges of the characters creating as much contrast and shade variance as space permits (C-1), Save the image.

C-1

d. In Photoshop, starting with A-1, use the Gradient tool to create a transitional gradient across the type face (D-1), Save the image.

D-1

Following screened examples show how each of the above influences a straight line screen pattern



Using **A-1**, a flat mono-tone, the screened lines are uniform

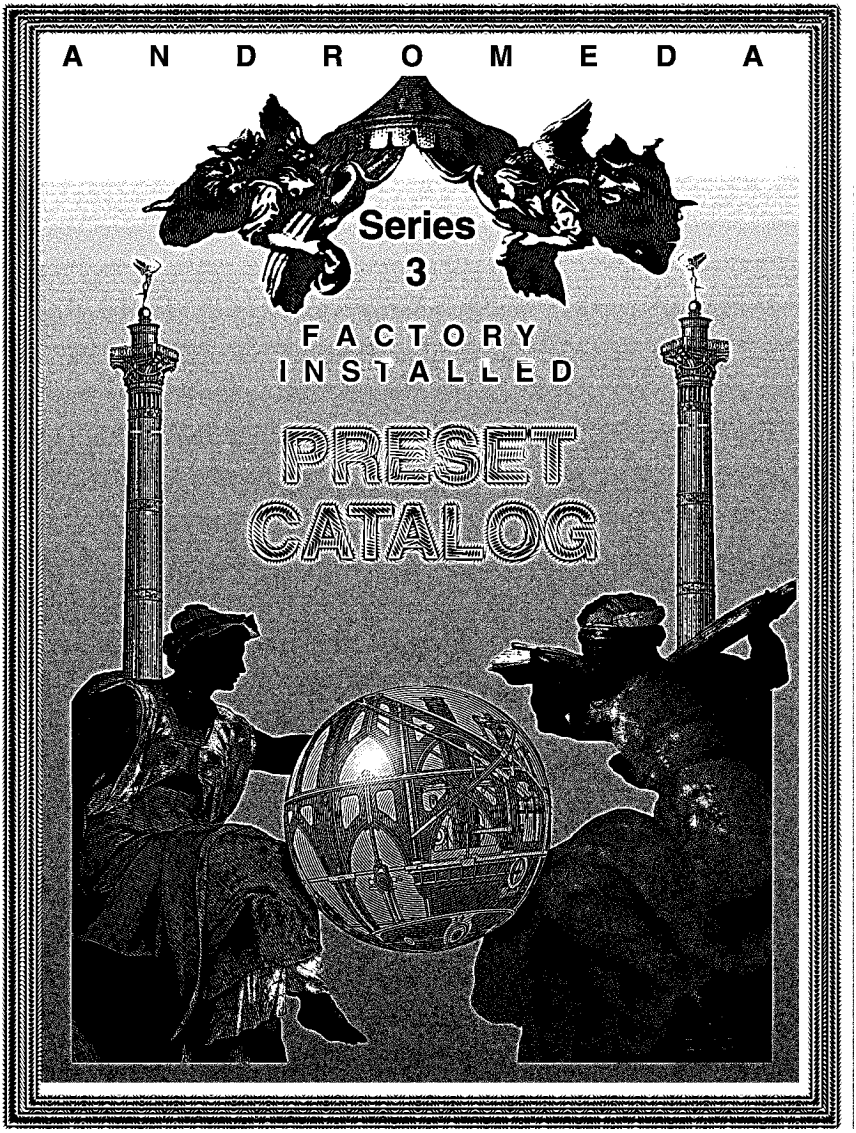
Using **B-1**, the screened lines are shaped in the highlight areas

Using **C-1**, the screened lines are washed out in the highlight areas

Using **D-1**, the screened lines are shaped by the gradient.

APPENDIX A

The following pages show screened output using Preset screens available in the Novice Mode. Presets are factory installed, ready to use screens. Select the screen type and resolution and you are done. One step! Please see Section 3.3 on “Rules and Tips for Good Screening”.



Mezzotint Presets

Mezzotint Presets, ready to use screens in Novice Mode, applied to GABEimage (Original Input Photo was 600 dpi)

Mezzotint
45 wpi

Mezzotint
100 wpi

Mezzotint
65 wpi

Mezzotint
133 wpi

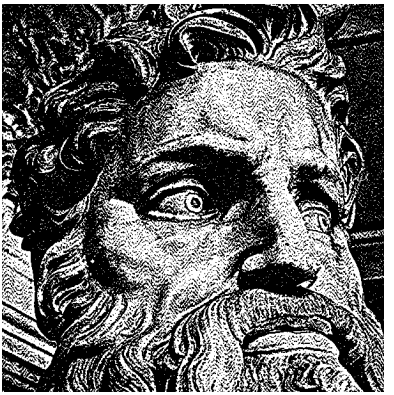
Mezzotint
85 wpi

Mezzotint
150 wpi

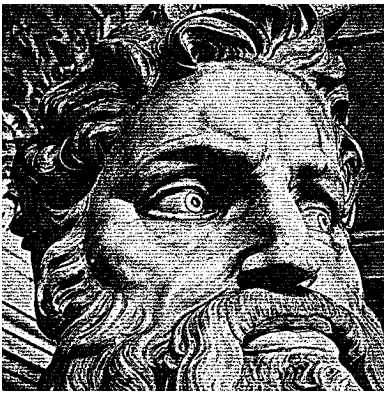
Mezzoblend Presets

Mezzoblend Presets, ready to use screens in Novice Mode, applied to MOSES image. (Original Input Photo was 600 dpi)

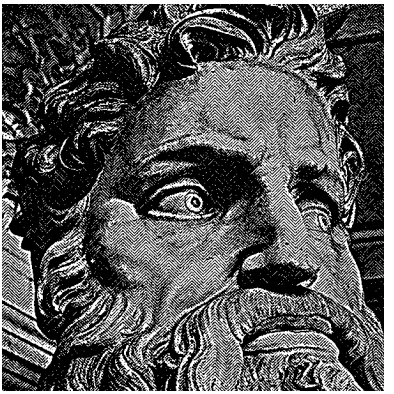
Mezzoblend Lines Vertical
65 wpi 30 lpi



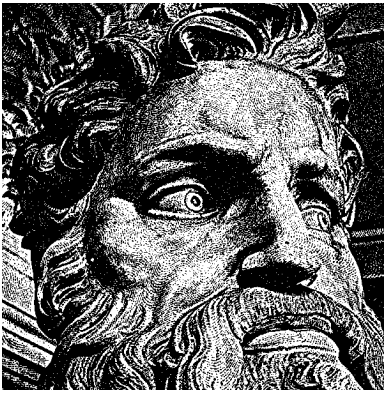
Mezzoblend Lines Wavy
70 wpi 45 lpi



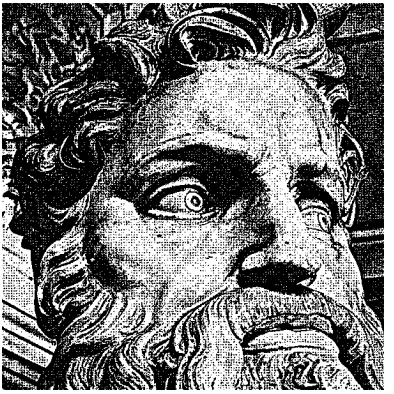
Mezzoblend Lines Straight
65 wpi 55 lpi



Mezzoblend Lines Wavy Sharp
70 wpi 65 lpi



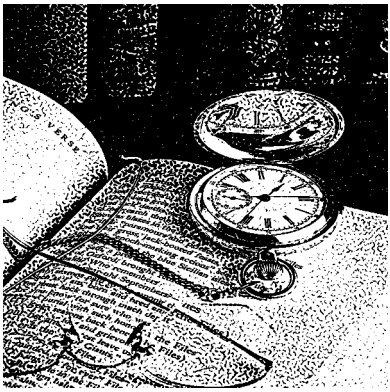
Mezzoblend Ellipses Wavy
65 wpi 75 lpi



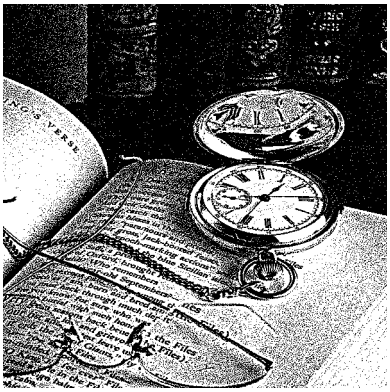
Mezzoblend Dots Round/ Square
75 wpi 75 lpi

Mezzogram Presets

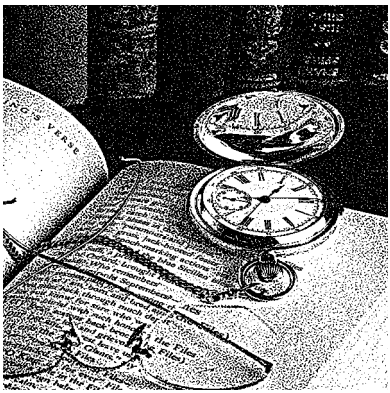
Mezzogram Presets, ready to use screens in Novice Mode, applied to Photodisc image. (Original Input Photo was 600 dpi)



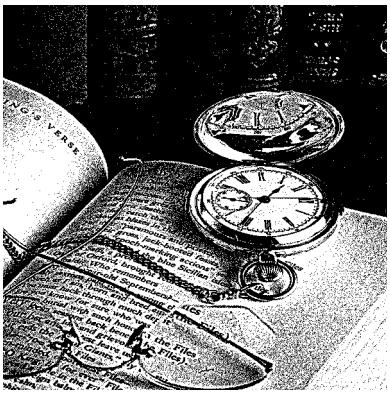
Mezzogram
35 lpi



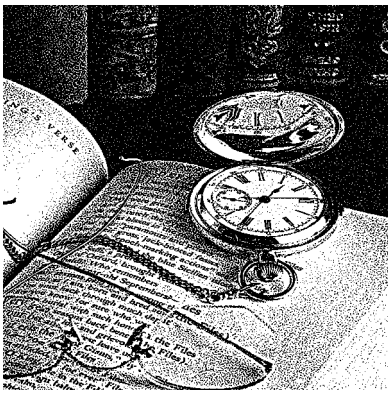
Mezzogram
85 lpi



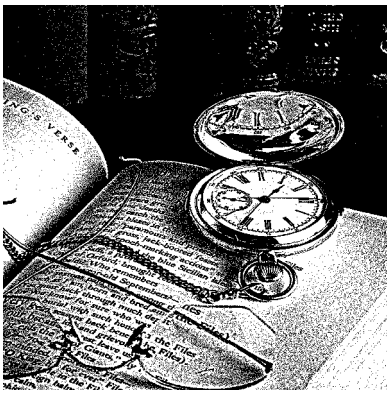
Mezzogram
55 lpi



Mezzogram
133 lpi



Mezzogram
65 lpi



Mezzogram
150 lpi

Special Effects Presets

Special Effect Presets, ready to use screens in Novice Mode, applied to Walk in Snow image. (Original Input Photo was 600 dpi)

Special Effects
Burlap

Special Effects
Compressed Chainlink

Special Effects
Etching

Special Effects
Zen

Special Effects
Butterflyeee

Special Effects
Decalcomanic Sunrise

APPENDIX B

Series 3 Screens and Color Files

This version of Series 3 Screens Filter works best with gray scale images. However the Filter will apply a user selected gray scale screen to each layer of a color RGB or CMYK file. The result is a spectacular textured image with a dramatic shift in output color compared to the original tones.

The following controls generate subtle color changes in the output screened image:

a. If you chose Uniform Mezzo as your screen and your image is CMYK, the checkbox “Special Mezzo” will double the lpi (screen ruling) in the black layer. Doing this will improve the quality of some images. This requires that Series 3 be run in all layers in one pass.

b. If you chose Uniform Mezzo, adjust X & Y Offset in each layer. Doing this will shift the output color. This requires that Series 3 be run in all layers separately

c. If you choose Pattern and use the Angle slider to give the screen a different angle for each layer, a variety of dramatic lost-in-time colors can be generated. This requires that Series 3 be run in all layers separately

Additional tips:
1.Duotones using Photoshop allows for the combination of two colors in a Series 3 screened gray scale image. The second color can also be another black or dark gray for richer dark tones. Duotoned mezzotint is a marriage between color photograph and illustration.

2. Colorizing Series 3 screened gray scale images in Fractal Painter™, Quark XPress™ or Adobe PageMaker™ create stunning colors resembling the look of colored antique prints

APPENDIX C

Printing Production Issues and Series 3 Screens.

Printed images in this manual reflect almost all issues associated with printing Series 3 screened output. If you have any specific questions on any of the images call Andromeda Technical Support at 805 379 4109, please have your Registration # available.

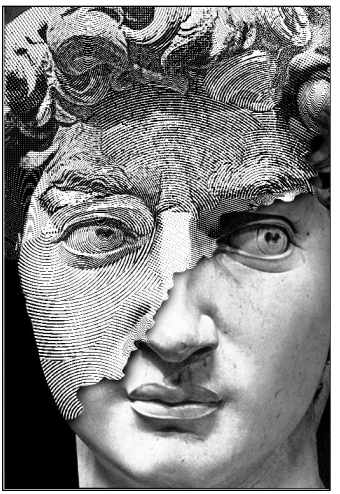
The following discusses types of screening jobs and associated printing production issues:

1. Screening your entire gray scale image.
This is generally what is done. Series 3 screened output is pure black and white line art. When Series 3 is done screening the entire image, and you are back in Photoshop, you must change the Mode to Bitmap using the 50% Threshold option. This significantly reduces the file size and categorizes the entire image as line-art for layout programs such as Quark XPress™ and Adobe PageMaker™ preventing any re-screening. (See also "Partial screening" and "Collaging" below).
Examples of such images are on pages 49, 50, 51, 55, 56, 59, 61, 63 and Appendix A. These images were placed in a Quark document as bitmaps (following Series 3 screening and after changing Mode in Photoshop from GrayScale to Bitmap using 50% Threshold Option).

2. Partial screening
If a partial selection is screened with Series 3, the entire image will need to remain as a gray scale. When this gray scale image is screened for printing, the Series 3 screened part being pure black and white will not be visibly affected, while the gray scale part will be screened with conventional halftone dot screening.
Examples are on Page 62 "Step 6/Step7" images, and Page 66 "Preset Catalog" image. These three gray scale images were partially screened in Series 3. During the production of this manual, these images were left as gray scale, placed in a Quark document page and filmed at 150 lpi, 2400 dpi resolution on a Agfa Accuset 1000 recorder

Compare the image on Page 62 "Step 7", a partially screened gray, scale, with "Step 9", a pure black and white bitmap. You will not notice any visible difference.

(Under a magnifying glass, in the Step 7 gray scale image, you will see subtle additional screening dots resulting from re-screening done by the Agfa recorder when the manual page was output to film for printing. No such thing is visible in the Step 9 image which was placed as a bitmap in the Quark document).



3. Re-screening a screened image
In the adjacent image “David”, different gray scale areas of the face were selected and screened independently. Occasionally a screened area was included with a gray scale selection intended for screening. The Series 3 Filter did not disturb the screened area, it screened the gray scale area only as expected. This is true as long as Enhance Photo Unsharp Mask is off or has positive values. (When Unsharp Masking values are negative additional screening is generated. See Appendix D, “Borders”)

4. Collaging a screened image into another Photoshop gray scale or color document.

You need to be aware of the following issues:

1. After Series 3 is done screening, let the output file remain as a gray scale or color file.

2. The gray scale or color document that the Series 3 screened output will be collaged into will need to be at the same resolution (dpi) as the screened image. The screen ruling (lpi) you used in your Series 3 screened image need not match the screen ruling for your Photoshop document. However we recommend that it not exceed the screen ruling your printer has recommended to print your Photoshop document.

An example of a collage is on Page 66 “Preset Catalog”. The borders, columns and sphere were screened with various patterns using Series 3; the angels and figures were partially screened. The background was a graduated tint, screened using a mezzotint screen. All the components were collaged in Photoshop. The collage was placed in a Quark document as a gray scale file and filmed at 150 lpi, 2400 dpi.

APPENDIX D

Borders.

The Series 3 Filter can produce highly decorative borders from simple margins.
We started with a 600 dpi empty canvas in Photoshop, using the marquee tool (while holding down the control key) to select simple square borders and filled them with various mid-tone values, including black. (Figure 1).

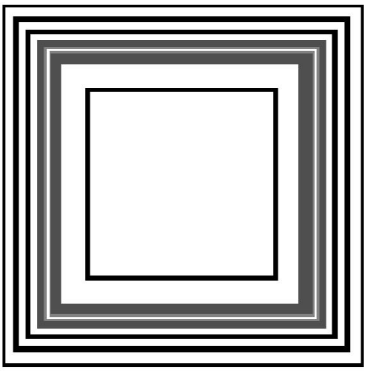


Figure 1

Next, we took the basic border design and applied the Serrated Chisel Preset which features an extremely high, negative unsharp mask setting. The filter produced a beautiful decorative border utilizing only the simple information it was provided from the gray scale. (Figure 2) .

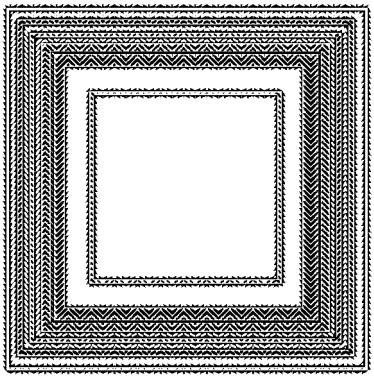


Figure 2

To add still greater detail and more decoration, the filtered border, as shown in Figure 2 was re-screened by applying the Serrated Chisel Preset twice more. Building on the previously screened lines the filter was able to produce an extremely elaborate design. (Figure 3).

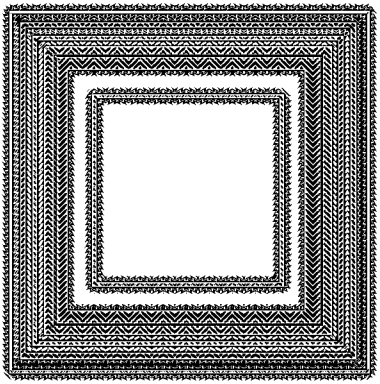


Figure 3